Contributions of Agriculture to Employment and the Economy in Southern California

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Executive Summary

Southern California has an immense economy, with a gross regional product of about $1 trillion—larger than all states except New York and Texas. Agriculture is also large in Southern California with farm gross revenue of more than $9 billion, ranking in the top 10 among states in the United States. The present study examines the contributions of farming and associated agricultural activities to the economy of Southern California. We describe the agricultural economy of Southern California and show its role in generating economic activity beyond the farm gate. Besides considering the region as a whole, we also develop data county-by-county. In addition, we build on our commodity description of Sothern California to assess the economic contributions of the major Southern California farm commodities.

The California gross state product (in year 2005 dollars) was about $1.73 trillion in 2010, about 13 percent of the U.S. total. Southern California, defined here as containing Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara and Ventura counties, has an inflation-adjusted gross regional product of about $0.98 trillion or about 57 percent of the California total. California is home to about 12 percent of the U.S. population, and Southern California is home to about 58 percent of the California population. (See Figure 1.1 for a map with Southern California counties highlighted.)

California agriculture is large, diverse and complex. Besides production of hundreds of commodities, dozens of which have sales of more than $200 million each, California agriculture encompasses vital manufacturing and services segments. Agricultural output and prices are naturally variable, driven by weather and global market conditions. Over the past five years, many farm prices have been high compared to the previous decade, but this is less true for the dairy, fruit, vegetables and horticultural products that are so important in Southern California. California agricultural products are shipped throughout the United States and globally, with exports comprising almost one-quarter of the market for many farm commodities. Southern California farm products are more oriented to the U.S. domestic market, and some face significant import competition.

Given the major urban population centers in the region, farming is necessarily a relatively small part of employment and the whole economy in Southern California. Farming alone comprises about 0.4 percent of the total gross regional product. This share ranges from about 15 percent in Imperial County, which has a small overall population, to less than 0.1 percent in the Los Angeles and Orange counties combined, where the urban population dominates and which themselves dominate the regional economy. The main Southern California agricultural regions and the irrigation system that serves them are displayed in Figure 1.2. Some relatively small areas are not shown on the map, but the most important production areas are highlighted.

Besides its economic impact, farming contributes to the landscape and broader ecosystem of Southern California. Even in Los Angeles and Orange Counties, there are almost 200 thousand acres of land in farms, much of which is pasture and rangeland. This open space is an important contributor to the visual and environmental amenities of the region. Conversion of farmland to more intensive urban uses is a concern to many in the region because of the perceived benefits of having a variety of land uses and the general amenity value of open space in a dense urban region. Moreover, urbanization uses more water per acre than does farming and ranching.

Although a small share of total economic activity in the region, farming in Southern California contributes significantly to the total California agriculture, especially for horticultural crops, dairy, and selected vegetables and fruits. Imperial County also contributes substantially to California field crop production such as hay.

We use the IMPLAN input-output model to assess how agricultural industries contribute to the rest of the economy in Southern California. (We use the IMPLAN Pro® version 3.0 software and accompanying 2010 dataset to determine the multiplier effects (Appendix B).) Specifically, we estimate the contributions of farming and other agricultural activities to employment and labor income, economic output, value added and government tax revenues. Southern California agricultural production and processing comprises 2.7 percent of regional output and about 1.4 percent of employment, labor income and value added. Accounting for both the direct and ripple effects of the sector on the broader economy, the contribution of agriculture to the regional economy almost doubles. That is, the industry multipliers are about 2.0 overall, larger in some cases and a bit smaller in others. Agricultural processing, including food and beverage manufacturing, has a larger part in the Southern California economy than does farming itself.

In total, Southern California agricultural industries, including farming, support activities and food processing, produced $48 billion in sales and directly employed 160 thousand workers in 2010. Farming alone produced $9 billion in sales and employed 40 thousand people. Accounting for ripple effects, agricultural industries generate about 450 thousand jobs, $25 billion in labor income and $42 billion in value added in the regional economy. In other words, the industry multipliers measuring the total effects of agriculture on regional employment and value added are each about 2.9. For farming, each additional job creates a total 2.7 jobs in Southern California and each dollar of value added creates $2.3 of economy-wide value added.

Tax contributions are often of particular interest to local economies and government officials. We calculate the impact of agriculture on taxes by considering the tax reductions from a 10 percent reduction in the agricultural economy. Reducing Southern California agriculture, including the processing industry, by 10 percent would reduce state and local tax revenues by almost $400 million, mostly from processing and related activities. Reducing farming activity by 10 percent would reduce state and local tax revenue by about $90 million.

We also explore how important farm industries each affect the economy of Southern California. We consider the impacts of strawberry, greenhouse and nursery, lettuce, dairy and avocado production in the context of their recent market environments, which differ over time and by location. Using the most applicable multipliers from the IMPLAN model (which apply to larger aggregates than specific crops), we consider the role of these crops in Southern California. Each of these industries is a significant contributor to employment and economic activity in the locations where they are centered. Fruit crops dominate Southern California farming, with strawberry farming contributing nearly $1 billion of the $2.5 billion Southern California fruit industry output in 2010, and avocado farming contributing about $400 million in output. Each job in these industries generates two additional jobs in the rest of the regional economy, adding to their significance for Southern California.

Agriculture plays a different role in the economy in each county in Southern California. Agriculture is influenced by differences in land characteristics, commodity mix and processing capabilities among the counties. Indeed, it is particularly important to consider variations across counties to appreciate the economic impacts of agriculture in Southern California. Agriculture is a very large part of the economy of the rural Imperial County. Ventura, Santa Barbara and even San Diego Counties also have large crop industries, including greenhouse and nursery products, vegetables and fruit. Ventura County farming, led by fruit farming, generates 20 thousand jobs and nearly $2 billion in value added to the county economy when including ripple effects. The greenhouse and nursery sector dominates San Diego County, comprising nearly half of the county's $1.5 billion farming output. The dairy industry is most important in Riverside and San Bernardino Counties. Farming has become a very small part of overall economic activity in Los Angeles and Orange Counties, but food processing and services are important enough to make Los Angeles agricultural output the largest among Southern California counties.

Overall, this report documents that agriculture remains a vital part of the Southern California economy, accounting for hundreds of thousands of jobs, billions of dollars of economic activity, and substantial tax revenues while providing open space, visual amenities and an important link for the increasingly urban population to its food and agricultural roots.

About the Authors

Jessica A. Vergati has been a Junior Research Specialist at the University of California Agricultural Issues Center since 2011 when she graduated from UC Davis with a degree in Animal Science and Management. Daniel A. Sumner is the Director of the UC Agricultural Issues Center and the the Frank H. Buck, Jr. Chair Professor in the Department of Agricultural and Resource Economics, UC Davis where he has taught and conducted research for about 20 years.

Acknowledgments

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1. Introduction

Southern California has a huge and complex economy centered on services and manufacturing, but with agriculture as an important component. The region is diverse, ranging from rural and desert areas to densely populated coastal locations. Large areas are fully urban with thousands of acres of residential and commercial land use and the famous grid of streets, roads and highways connecting them. At the same time, there are also thousands of acres of farmland in the region, from carefully cultivated fruit and vegetable acreage to range and pasture land. Intensive greenhouse and nursery operations and confinement dairy farms are also part of the agricultural mix.

This study investigates the role of agriculture in the economy of Southern California, here comprising the eight counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara and Ventura. We first describe the California economy as it emerges gradually from severe recession and then characterize agriculture in the state. Farming as a whole did not suffer a recession and, by some measures, has been in stronger economic health recently than in the previous decade. Of course, the price and production conditions in agriculture vary by commodity industry, for example with the livestock industries, especially dairy, facing very high feed prices and output prices that have not kept up.

The main thrust of the report focuses on the key commodities in Southern California, including avocados, fresh vegetables, and greenhouse products, strawberries and dairy products. These commodities and others generate more than $9 billion in gross revenue and have multiplier effects throughout the economy. The main commodities and the share of agriculture in the overall economy differ by county. Imperial produces field crops, vegetables and other commodities, and agriculture is a major part of the overall economy in this rural county. Santa Barbara and Ventura are major fruit and vegetable producers and, because their urban centers are smaller, agriculture is also significant in the local economies. San Diego is the home of vibrant avocado, greenhouse and nursery industries, but because the overall economy is so large, these are smaller relative to the whole. In addition to crops, agriculture in Riverside and San Bernardino counties includes an important dairy industry. Finally, farming is only a small share of the huge economies in Los Angeles and Orange counties.

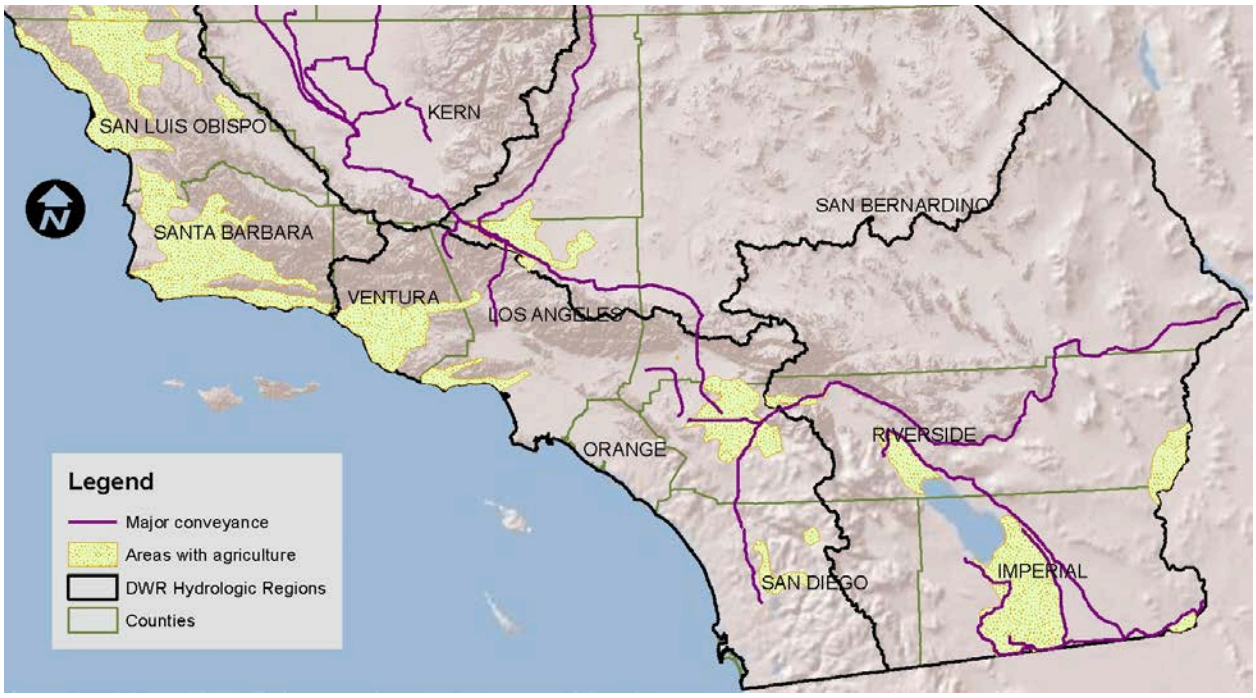
To consider how farming and the processing and service aspects of agriculture contribute to the whole economy in Southern California and each county, we use a model of the ripple effects or multipliers that quantify these relationships. The results show that hundreds of billions of dollars in production, millions of dollars of tax revenue

and hundreds of thousands of jobs in Southern California rely on agriculture. Including the direct and indirect effects documents just how deeply agriculture is woven into the fabric of economic activity in Southern California.

Figure 1.1. A map of California, highlighting Southern California counties

Source: Digital-topo-maps.com (2005). California County Map. Accessed May 2012: http://www.digital-topo-maps.com/county-map/california.shtml

Figure 1.2. Southern California agricultural areas and water conveyance infrastructure



Source: Medellin-Azuara, Josue (2011) from Hanak, E., Lund, J.R., Dinar, A., Gray, B., Howitt, R., Mount, J., Moyle, P., Thompson, B. (2011). *Managing California Water from Conflict to Reconciliation*. PPIC Press, San Francisco, CA.

2. Broad Economic Context

In order to understand the role of agriculture in Southern California, we first sketch the nature of the larger economy and agriculture in California as a whole. This includes an overview of data on the national and state income and sources of incomes, as well as the state population.

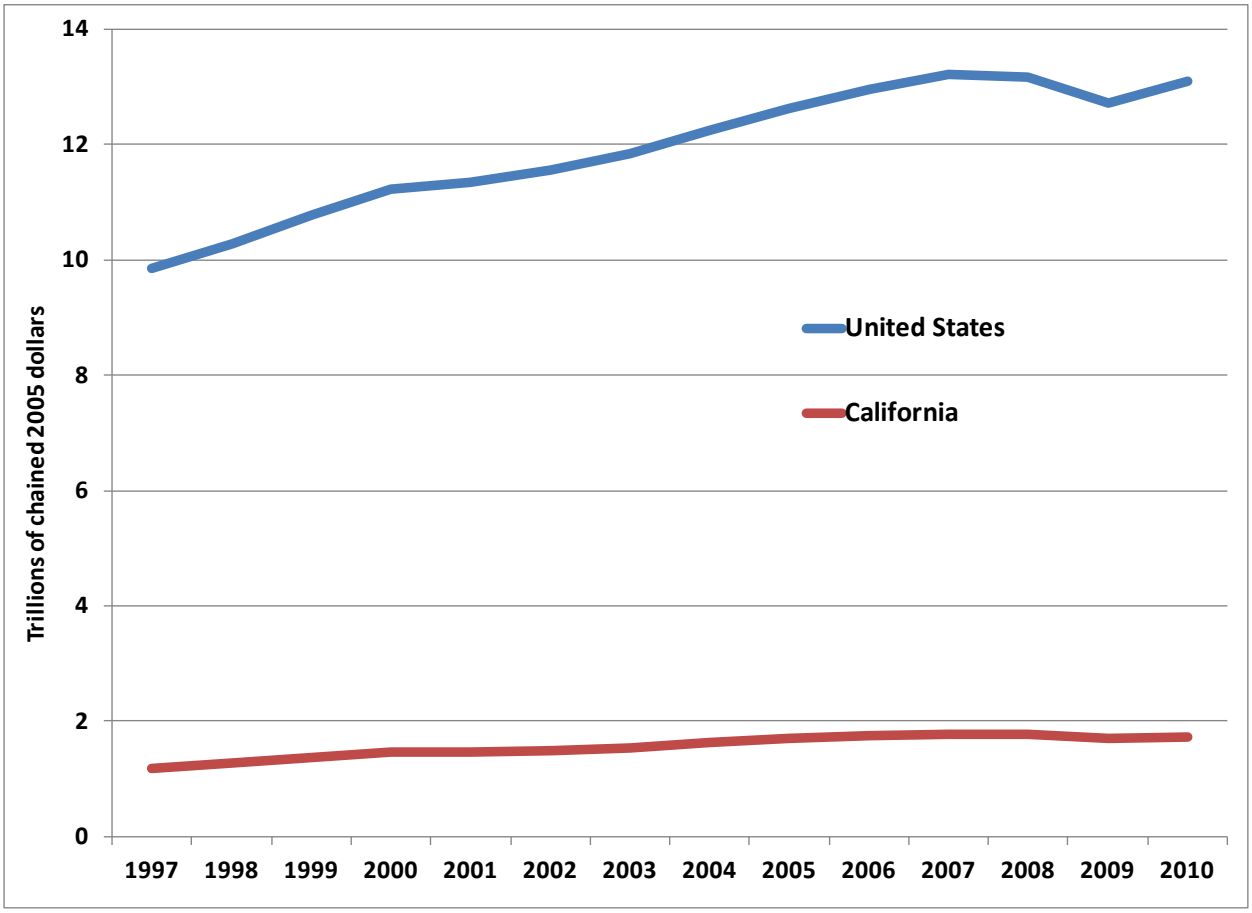
2.1 The National and State Economy

United States real (year 2005 inflation-adjusted) gross domestic product (GDP) was $13.1 trillion in 2010, signaling the start of national economic recovery after the recession 2008 and 2009. U.S. real GDP was $12.7 trillion in 2009, its lowest level since 2005. During the recession, national and international economic growth turned negative: adjusted for inflation, U.S. GDP fell 3.5 percent from 2008 to 2009 (Figure 2.1.1). Over the period from 1997 to 2010, average U.S. real GDP annual growth was about 2.2 percent.

The California state economy grew faster than the rest of the United States during the period from 1997 to 2010, averaging 3.0 percent growth each year when adjusted for inflation. Real gross state product (GSP) was $1.73 trillion in 2010, down from a high of $1.77 trillion (in year 2005 dollars) in 2007. Southern California has a gross regional product of about 0.98 trillion or about 57 percent of the California total. From 2008 to 2009, GSP fell 3.7 percent to $1.70 trillion due to the national recession.

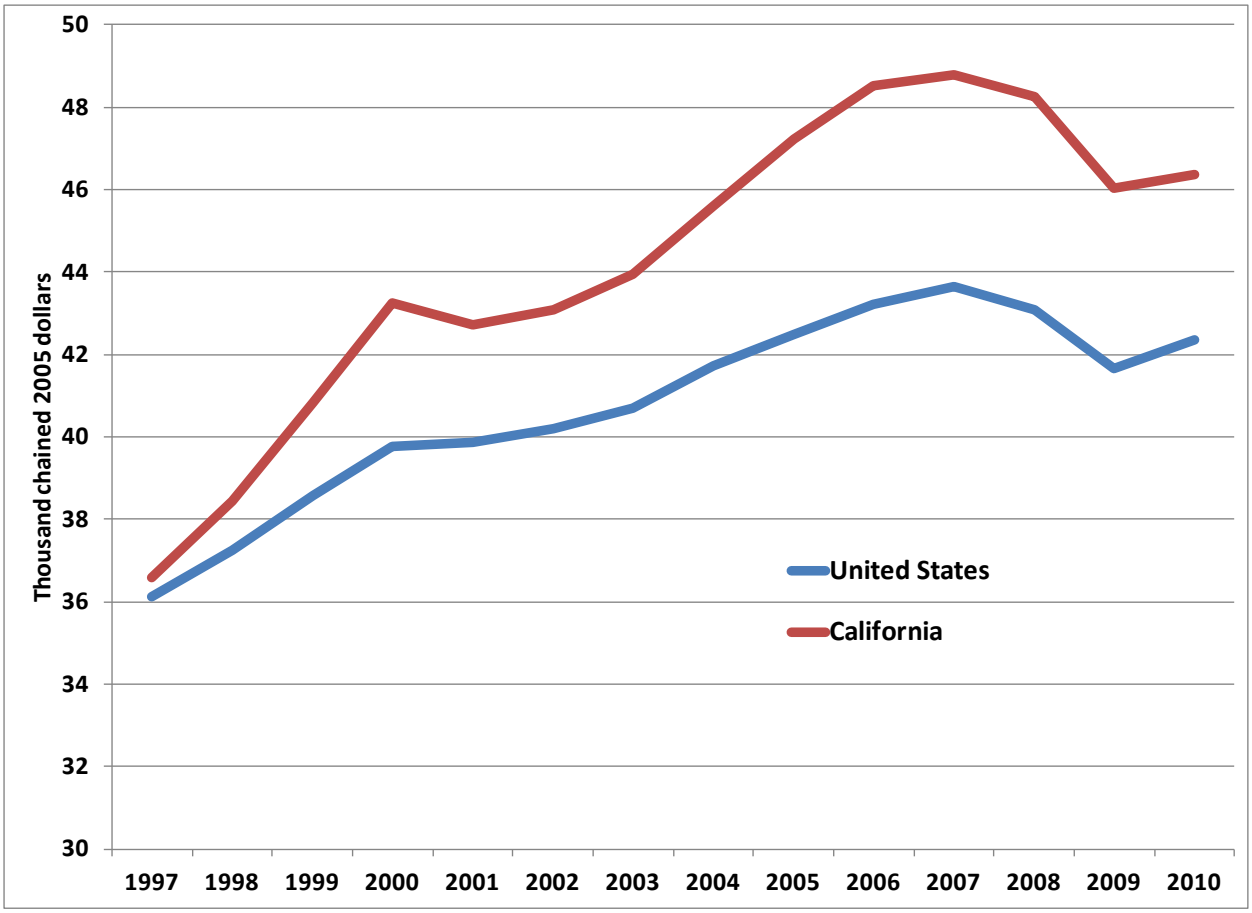
In real terms, per capita income in California is higher than in the rest of the nation. Both U.S. and California real per capita income peaked in 2007: the U.S. at $43,633 per person and California at $48,789 (Figure 2.1.2). California per capita income reached this peak faster, rising 33 percent from 1997 to 2007 versus a 20 percent increase nationally. However, during and after the recent recession, per capita income fell less substantially and recovered more quickly in the U.S. than in California.

Figure 2.1.1. Real gross domestic product (in chained 2005 dollars), United States and California, 1997-2010



Source: U.S. Department of Commerce, Bureau of Economic Analysis (2012). National and Regional Data, GDP & Personal Income. http://www.bea.gov/iTable/

Figure 2.1.2. Real per capita income (in chained 2005 dollars), United States and California, 1997-2010



Source: U.S. Department of Commerce, Bureau of Economic Analysis (2012). National and Regional Data, GDP & Personal Income. http://www.bea.gov/iTable/

2.2 California Population

Over the past thirty years, the California population has increased by an average annual rate of 1.5 percent, but this growth has slowed over time. Population growth rates averaged about 2.3 percent annually during the 1980s, 1.3 percent during the 1990s, and 0.9 percent in the 2000s. As of 2011, the population of California numbered 37.69 million.

The Southern California population reached 21.45 million people in 2009 (58 percent of the state population). Los Angeles County is a highly urban area containing the majority of the region's population, or 9.8 million people in 2009. San Diego and Orange counties each have about 3 million people, while Riverside and San Bernardino counties each have populations of roughly 2 million. Imperial County, which is largely desert land, is the least inhabited county in Southern California with about 167 thousand residents.

The Southern California population grew at the same average annual rate as the rest of the state during the 2000s (0.9 percent). This translates to a total population increase of 8 percent over the 2000-to-2009 period. In the same period, San Bernardino and Imperial counties had the fastest-growing populations, with average annual growth rates of 17 percent. In contrast, Ventura and Orange counties each grew by about 6 percent annually while Santa Barbara County grew slowest at 2 percent per year.[1]

[1] Sources: U.S. Census Bureau, Population Division (2010). Annual Estimates of the Resident Population for Counties of California: April 1, 2000 to July 1, 2009 (CO-EST2009-01-06). Accessed May 2012: http://quickfacts.census.gov/qfd/states/06/06025lk.html

U.S. Department of Commerce, Bureau of Economic Analysis (2012). Regional Data, California. Personal income summary, Population. Accessed May 2012: http://www.bea.gov/iTable/

2.3 California Agriculture and Related Industries

In 2009, nominal California GSP was $1.85 trillion. At $25 billion (Table 2.3.1), agriculture (farming, forestry, fishing, hunting, and support services) accounted for 1.3 percent of the total California GSP. Almost 70 percent of California agricultural value-added was from crop and animal production.

Food, beverage and tobacco manufacturing is also a major industry, producing $22 billion in GSP and contributing about $11 billion in employee compensation in 2009. With nearly $81 billion in sales, the California food, beverage and tobacco manufacturing industry employed over 200 thousand workers in 2007 (Table 2.3.2). In that year, there were 4,564 establishments in the state that process farm products to produce foods, beverages and tobacco. The bakery and tortilla manufacturing group has the largest number of establishments (36%) and employees (21%), but the beverage and tobacco industries are the largest in sales (24%). Wineries account for most of the beverage sales value (fluid milk processing is included with dairy products).

Table 2.3.1. California gross state product by industry, 2009

	Compen-sation to employees[a]	Taxes on production & imports[b]	Gross operating surplus[c]	Value added[d]
	($ billion)			
Agriculture[e]	12.10	-1.00	13.65	24.75
Mining and utilities	11.59	9.36	26.42	47.38
Manufacturing and construction	160.05	9.65	103.69	273.39
Food and beverages manufacturing	11.04	3.86	7.02	21.91
Wholesale trade	49.26	24.82	23.66	97.73
Retail trade	58.74	26.30	22.03	107.06
Transportation and warehousing[f]	25.18	2.59	15.16	42.92
Information, finance and insurance	111.14	6.44	109.88	227.46
Real estate, rental, and leasing	15.05	26.54	267.77	309.36
Professional & management services	125.85	2.59	63.38	191.83
Administrative and waste services	37.28	1.11	12.30	50.69
Educational services	15.62	0.82	1.52	17.95
Health care and social assistance	93.34	2.88	21.84	118.06
Arts, entertainment, and recreation	15.23	0.76	6.03	22.01
Accommodation and food services	30.95	5.29	12.93	49.17
Other services, except government	27.85	2.97	13.04	43.86
Subtotal private industries	**789.22**	**121.09**	**713.29**	**1,623.60**
Government	**204.74**	**-3.07**	**21.77**	**223.45**
Total gross state product[g]	**993.96**	**118.03**	**735.06**	**1,847.05**

Source: U.S. Department of Commerce, Bureau of Economic Analysis. Regional Data. GDP & Personal Income. 2011. Accessed Jul. 2011: http://www.bea.gov/regional/gsp/

[a] Compensation of employees is the sum of employee wages and salaries and supplements to wages and salaries. Wages and salaries are measured on an accrual, or "when earned" basis, which may be different from the measure of wages and salaries on a disbursement, or "when paid" basis. Wages and salaries and supplements of federal military and civilian government employees stationed abroad are excluded from the measure of GSP.

[b] Taxes on production and imports consist of tax liabilities, such as general sales and property taxes that are chargeable to business expense in the calculation of profit-type incomes. Also included are special assessments. This figure is the sum of state and local taxes—which are primarily non-personal property taxes, licenses, and sales and gross receipts taxes—and federal excise taxes on goods and services. Negative values for agriculture are taxes net direct government subsidies.

[c] Gross operating surplus is a value derived as a residual for most industries after subtracting total intermediate inputs, compensation of employees, and taxes on production and imports less subsidies from total industry

output. Gross operating surplus includes consumption of fixed capital (CFC), proprietors' income, corporate profits, and business current transfer payments (net).

[d] Value added is equal to the sum of compensation to employees, taxes on production and imports, and gross operating surplus.

[e] Agriculture includes farm production, forestry, fishing, hunting, and support services such as soil preparation, planting, harvesting, and management (on a contract or fee basis).

[f] Not including U.S. Postal Service.

[g] Gross state product (GSP) is the sum of value added by labor and capital in all industries located in the state.

Table 2.3.2. California food, beverage and tobacco manufacturing industry, 2007

Manufacturing industry	Establishments	Sales	Payroll[a]	Employees
		($ million)	($ million)	
Animal feed[b]	132	2,897	220	4,626
Grain and oilseed milling	87	4,073	194	4,100
Sugar and confectionery products	207	2,587	350	7,974
Fruit & vege. preserving & specialty food	302	12,279	1,240	35,619
Dairy products	190	12,467	771	15,947
Animal slaughtering and processing	250	7,656	690	22,120
Seafood product preparation & packaging	47	1,054	76	2,426
Bakeries and tortilla	1,659	6,528	1,225	41,958
Other food[c]	536	11,857	1,131	30,277
Beverages and tobacco	1,154	19,387	1,770	38,847
Total food, beverages and tobacco	**4,564**	**80,786**	**7,668**	**203,894**

Source: U.S. Census Bureau. 2007 Economic Census. Detailed Statistics by State. April, 2010. Accessed Jul. 2011: http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ECN&_submenuId=datasets_4&_lang=en

[a] Annual payroll.

[b] Includes pet and agricultural animal feed.

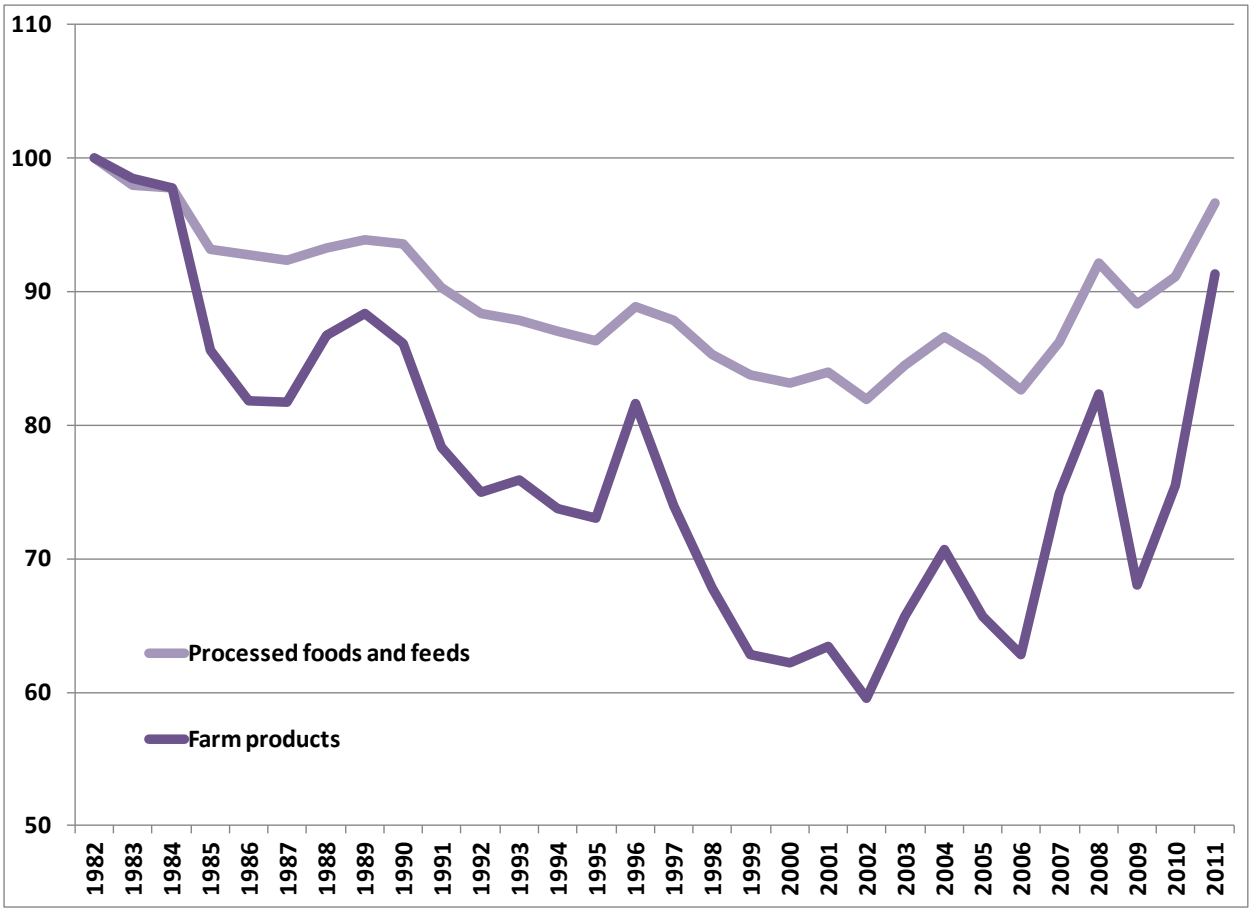
[c] Includes snack food, coffee, tea, syrup, condiments and spice manufacturing.

2.4 Agricultural Prices

U.S. producer prices for agricultural goods have changed significantly in the last ten years. Real prices were decreasing for farm products (plant and animal) and processed foods and feeds for three decades before taking an upward turn in the early 2000s (Figure 2.4.1). Large fluctuations in commodity prices from 2002 onward led to major peaks in 2008 and in 2011, when real prices were back to within 10 percent of 1982 levels. Figure 2.4.2 shows that these price swings were largely reflected in the U.S. grain markets, where real prices reached about 120 percent of 1982 levels. Producer prices for fresh fruits and vegetables have shown little trend since 1992. The fruit producer price index was reweighted in 1991, which explains the large drop from 1991 to 1992.

Prices for individual California commodities show a wide variety of trends within markets. Figure 2.4.3 shows real prices for a half dozen of California's top commodities, for which the state is the sole or major producer in the U.S. Wine grape prices have been declining since the late 1990s. In contrast, lettuce prices have risen slowly, and in 2010 were 30 percent higher than in 1980. Prices for navel oranges have become less volatile since the 1980s, but have shown no notable upward or downward trend. Rice and almond prices fell quickly in the early 1980s and have since revealed no discernible pattern beyond annual fluctuations. At the same time, dairy prices have declined to about 50 percent of their 1980 levels while showing increasing volatility.

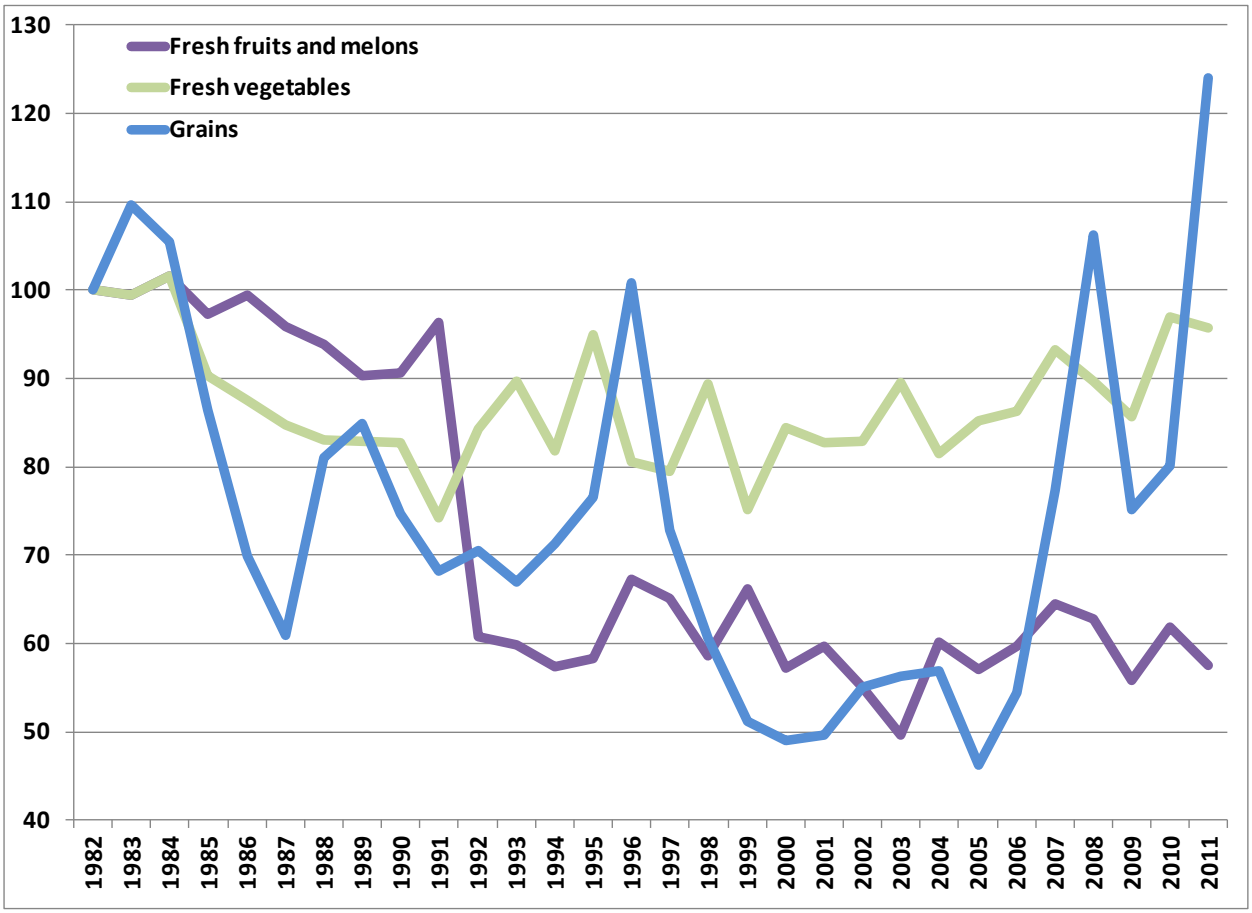
Figure 2.4.1. Index of real (2005 dollar) producer prices for U.S. agricultural products (1982=100)



Source: U.S. Department of Labor, Bureau of Labor Statistics (2012). Producer Price Database, Commodity Data. Accessed May 2012: http://www.bls.gov/data/#prices

Bureau of Economic Analysis GDP price deflator, year 2005=100. http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

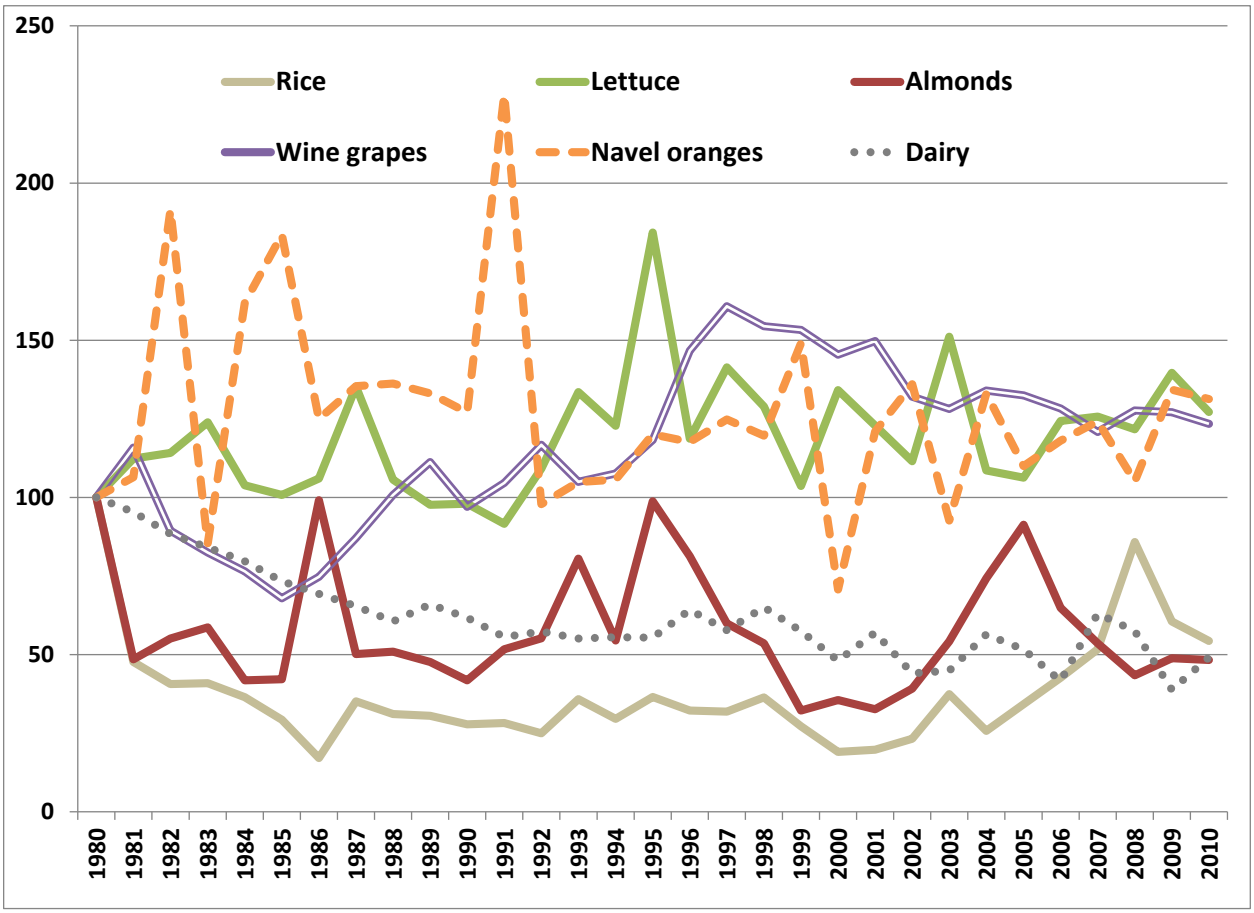
Figure 2.4.2. Index of real (2005 dollar) producer prices for U.S. crops (1982=100)



Source: U.S. Department of Labor, Bureau of Labor Statistics (2012). Producer Price Database, Commodity Data. Accessed May 2012: http://www.bls.gov/data/#prices

Bureau of Economic Analysis GDP price deflator, year 2005=100. http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

Figure 2.4.3. Index of real (2005 dollar) producer prices for selected California crops (1980=100)



Source: USDA, NASS (2012). Statistics by State, California Historical Data. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Historical_Data/index.asp

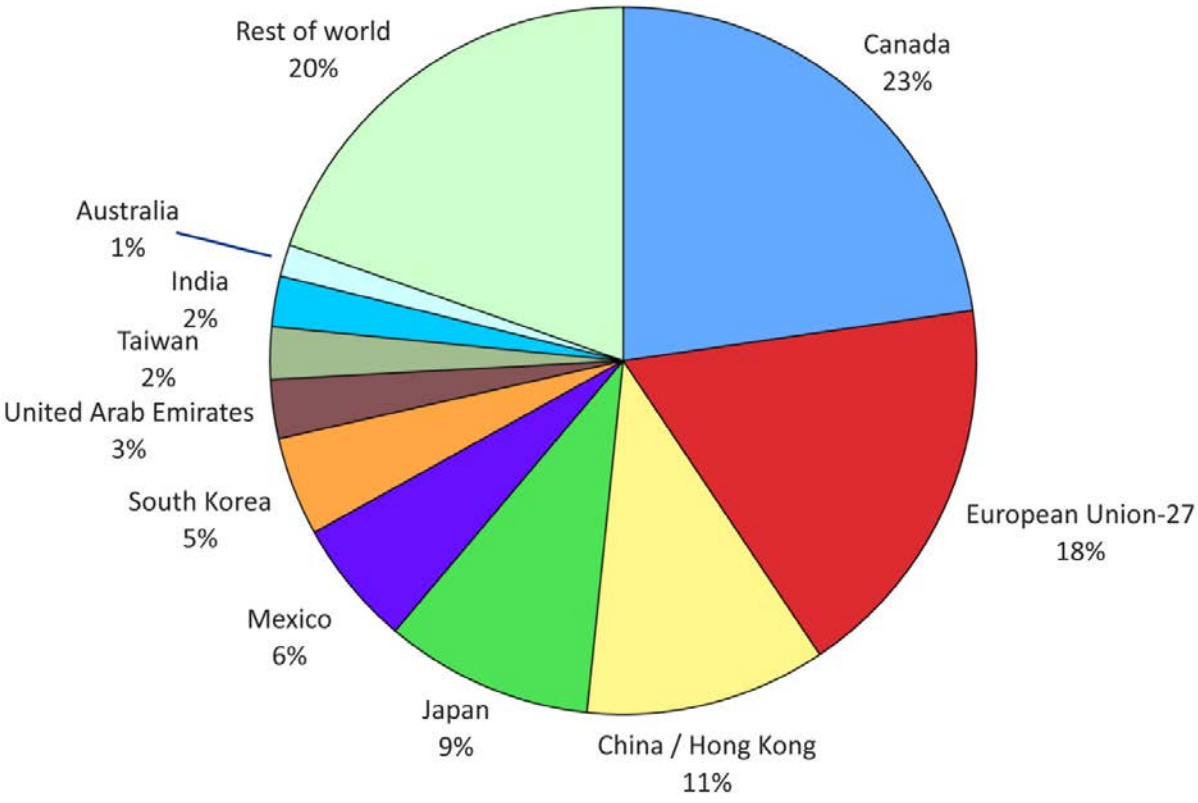
Bureau of Economic Analysis GDP price deflator, year 2005=100. http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

2.5 California Agricultural Exports

California is a major exporter of agricultural products in the U.S. and abroad. In 2010, California supplied 60 percent each of U.S. fruit and vegetable exports, all U.S. tree nuts, one-quarter of nursery and floriculture exports, 11 percent of animal products, and 13 percent of field crop exports. These commodities are shipped to many locations around the world: chiefly Canada, the European Union and Asia (Figure 2.5.1).

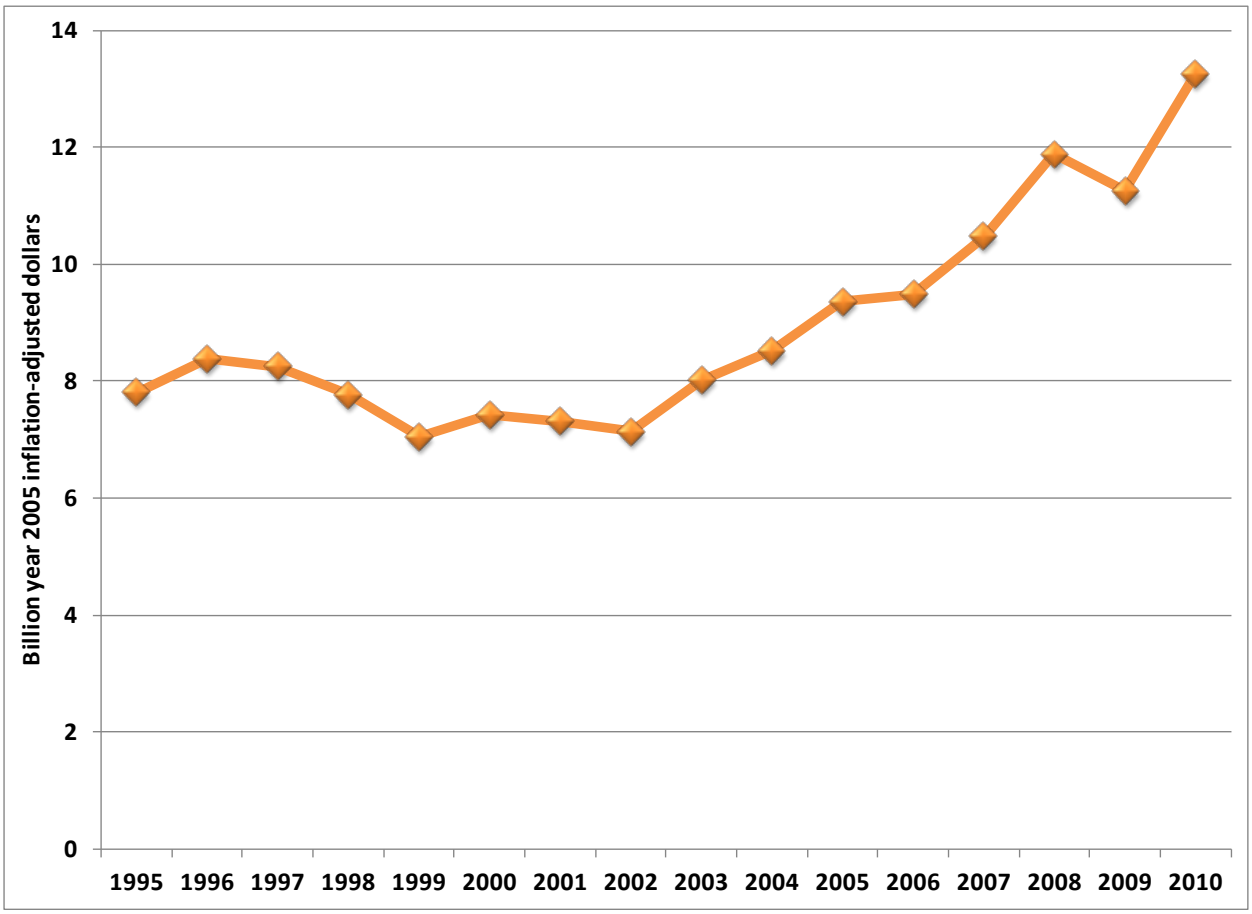
Total California agricultural export values have been on an upward trend since the early 2000s, partly because as the U.S. dollar weakens U.S. exports become more attractive to global consumers (Figure 2.5.2). Exports dropped in 2009, but recovered strongly in 2010. In real terms, California exported $13.3 billion of agricultural products in 2010. Almonds lead the state's commodities in export value with $2.4 billion in 2010, followed by dairy products, wine, walnuts and rice (Table 2.5.1). These top five commodities account for over 60 percent of California's total agricultural export value. Avocados are also a principal exported commodity with $28 million in 2010 export value, a seven-fold increase over the previous year.

Figure 2.5.1. California agricultural export value by destination, 2010



Source: University of California, Agricultural Issues Center (2012). 2010 California Agricultural Export Data. Accessed May 2012: http://aic.ucdavis.edu/

Figure 2.5.2. California agricultural export value, 1995-2010



Source: University of California, Agricultural Issues Center (2012). 2010 California Agricultural Export Data. Accessed May 2012: http://aic.ucdavis.edu/

Bureau of Economic Analysis GDP price deflator, year 2005=100. http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

Table 2.5.1. California agricultural product export values and rankings, selected commodities, 2008-2010

2010 Rank	Product	2008	2009	2010	Change in Value 2009 to 2010
		Export Value in million dollars			(Percent)
1	Almonds[1]	1,899	1,923	2,392	24
2	Dairy and products	1,214	608	1,143	88
3	Wine	910	812	1,007	24
4	Walnuts	491	666	820	23
5	Rice	552	877	797	-9
9	Tomatoes, processed	490	458	492	8
11	Lettuce	338	320	331	3
13	Strawberries	303	297	327	10
15	Beef and products[1]	228	206	293	43
18	Lemons[1]	159	134	148	11
20	Broccoli	120	113	129	14
25	Flowers and nursery[1]	82	83	86	4
28	Celery	60	59	62	4
29	Tomatoes, fresh[1]	48	60	59	-2
39	Avocados	9	3	28	711
Total Principal Commodities[2]		6,904	6,619	8,114	21
Total Other Products and Mixtures [3,4]		1,791	1,689	1,880	11
Total All Agricultural Exports[5]		8,694	8,308	9,994	19

Source: University of California, Agricultural Issues Center (2012). 2010 California Agricultural Export Data. Accessed May 2012: http://aic.ucdavis.edu/

[1] Export values were revised for 2009 based on updated production data from the U.S. Department of Agriculture/National Agricultural Statistics Service.

[2] Total principal commodity values for 2008 and 2009 were revised based on updates to USDA-NASS production data and estimation methodologies related to exports of hay and seeds for sowing.

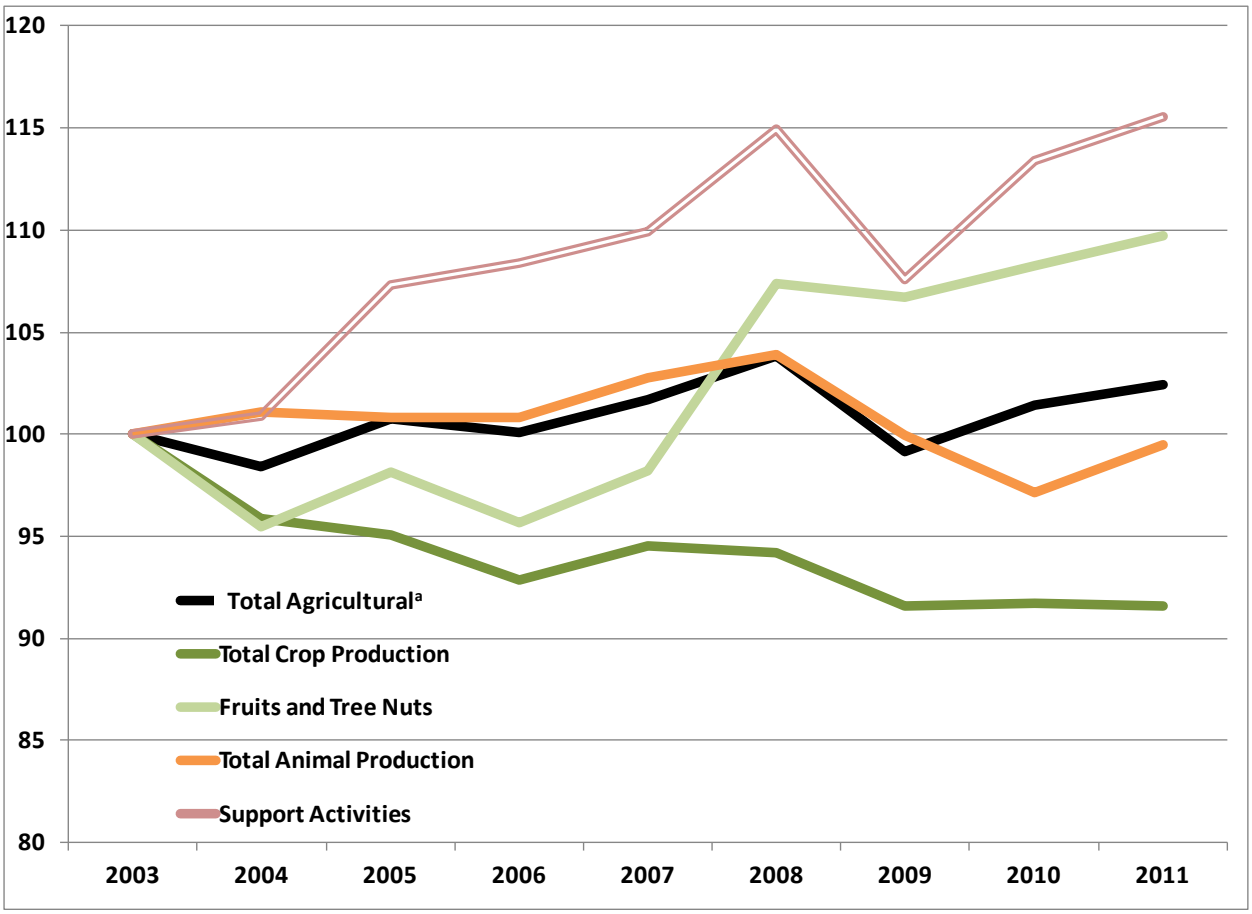
[3] The value for "Total Other Products and Mixtures" is composed of (a) highly processed products that are difficult to attribute to a specific commodity such as mixtures of fruits, nuts and vegetables and other processed foods; and (b) animal and plant products marketed in such small quantities that they are not included in the top 57 leading commodities. This category no longer includes seeds for sowing.

[4] Total other products and mixtures values for 2008 and 2009 were revised based on the elimination of seeds for sowing from this category.

2.6 Employment in Agriculture

Total California agricultural employment, including farming, support services, and farm labor and management, has not changed much since 2003 (Figure 2.6.1). However, some industries within the agricultural sector have had substantial changes in employment. For example, the number of workers in agricultural support industries was 15 percent higher in 2011 than in 2003. Fruit and tree nut employment has risen more than 10 percent since 2007. On the other hand, employment in crop production as a whole has fallen by nearly 10 percent from 2003 levels. Employment in agricultural industries generally expanded in 2010 and 2011.

Figure 2.6.1. Index of average monthly hired farm workers in California[a], 2003-2011



Source: California Employment Development Department (2012). Agricultural Employment in California. USDA-NASS Detailed Agricultural Employment and Earnings Data. Accessed May 2012: http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=158

[a]Total agricultural includes total crop and animal production, support activities for production, and farm labor and management (not pictured).

3. Overview of Southern California Agriculture

Before turning to the impacts of agriculture on the economy, we describe the magnitude and configuration of Southern California agriculture. As with earlier chapters, we focus on the whole eight-county region, on county-by-county information, and on sub-regions of particular interest. Given the huge size of the Southern California economy and the diverse nature of urban economic activity, it is no surprise that farming does not comprise a large share of the whole.

3.1 Farming's Share in the Regional Economy

Farming (crop and animal production) is a relatively small contributor to the Southern California economy. During the 2000s, GDP from farming averaged 0.44 percent of total regional GDP (Table 3.1.1). In contrast, farming represents about 1 percent of the entire state economy. This share varies considerably by county. For example, from 2001 to 2009, farming in Imperial County accounted for between 13 and 18.5 percent of county GDP. For highly built-up counties such as Los Angeles and Orange, the share is about 0.1 percent.[2]

3.2 Regional Employment in Agriculture

As the Southern California agricultural industry decreases as a share of the economy, employment in the sector also shrinks. The average number of Southern Californians working in agriculture (crop and animal production, production support activities, and farm labor and management) each month has exhibited a slight downward trend since 2003, albeit with considerable annual variation (Figure 3.2.1). Generally, the agricultural workforce remains within 80 percent of 2003 levels.

Employment trends in individual aspects of agriculture vary. Employment in crop production has generally decreased, dropping as low as 70 percent of 2003 levels in 2010 before recovering to 90 percent of 2003 employment in 2011. Within crop production, fruit and nut crop employment has shown the opposite pattern, reaching 115 percent of 2003 levels by 2011. However, the number of workers in animal production has fallen dramatically and was at about half of its 2003 level in 2010. Employment in the agricultural support sector has shown little trend but tends to mirror changes in fruit and nut production.

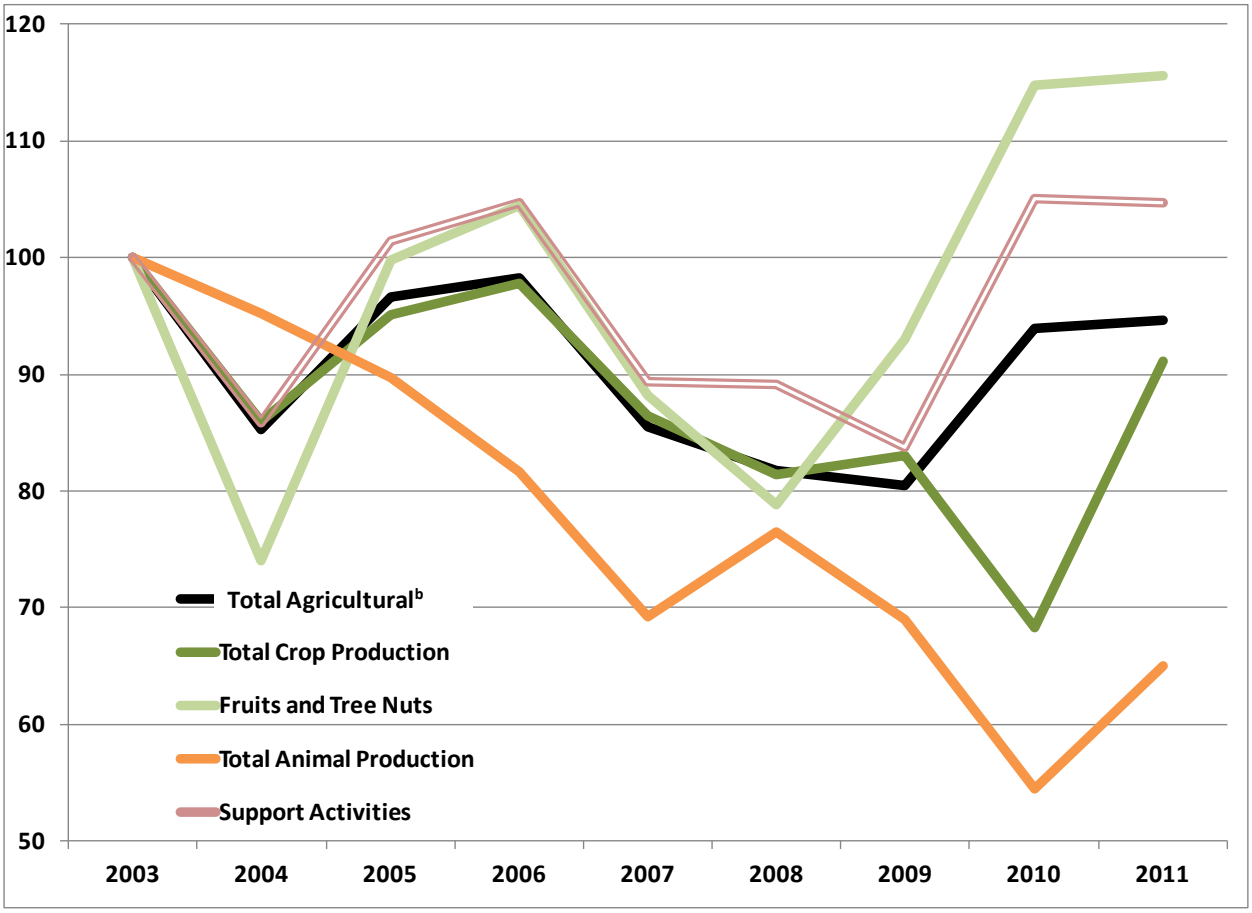
[2] For comparisons to IMPLAN data in Sections 4 and 6, use share of value added from farming as an approximation of share of GDP from farming.

Table 3.1.1. Farming share of total GDP in Southern California, 2001-2009

	2001	2002	2003	2004	2005	2006	2007	2008	2009
	percent								
Imperial	15.05	18.48	16.29	15.30	14.91	13.01	13.22	17.75	14.86
LA & Orange	0.12	0.11	0.12	0.10	0.10	0.10	0.09	0.07	0.06
Riverside & San Bernardino	1.23	0.95	1.10	1.20	0.90	0.66	0.99	0.86	0.64
San Diego	0.45	0.44	0.46	0.49	0.45	0.40	0.40	0.35	0.33
Santa Barbara	3.21	3.47	3.72	3.48	3.17	3.30	3.21	3.37	3.67
Ventura	2.00	2.14	2.21	2.62	2.31	2.87	2.72	3.06	3.03
Southern California	**0.46**	**0.45**	**0.48**	**0.49**	**0.43**	**0.41**	**0.43**	**0.42**	**0.39**
California Total	**0.96**	**0.96**	**1.07**	**1.21**	**0.99**	**0.89**	**1.07**	**1.02**	**0.92**

Source: U.S. Department of Commerce, Bureau of Economic Analysis (2012). Regional Data, GDP & Personal Income. Accessed May 2012: http://www.bea.gov/iTable/index_nipa.cfm

Figure 3.2.1. Index of average monthly hired farm workers in Southern California[a] (1980=100)



Source: California Employment Development Department (2012). Agricultural Employment in California. USDA-NASS Detailed Agricultural Employment and Earnings Data. Accessed May 2012: http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=158

[a]Southern California includes San Luis Obispo County because EDD presents aggregate, rather than county, data for both the South Coast and Desert regions.

[b]Total agricultural includes total crop and animal production, support activities for production, and farm labor and management (not pictured).

3.3 Agricultural Land

Among the eight Southern California counties, 18,100 farms cover 2.8 million acres of arable land (Table 3.3.1). These farms represent 22 percent of all California farms and 11 percent of the state's farmland (Table 3.3.1A). Southern California also holds about 11 percent of the state's harvested cropland, or 858,326 acres, located mostly in Imperial and Riverside counties. Not including San Bernardino and Orange counties, which did not report pastureland acreage in 2007, Southern California contains less than 7 percent of California pastureland, the majority of which is in Santa Barbara. Farms in the southern part of the state sold $7 billion in agricultural products in 2007, 77 percent of which was from crops. The average Southern California farm is 154 acres and generates $388,400 in sales, smaller than the state averages of 313 acres and $418,164 per farm.

The agricultural land in Southern California not only produces food, feed, foliage and flowers, but also adds to the open spaces of a community, offering both recreational and aesthetic amenities to neighboring residential areas. A vital issue in Southern California and across the country is the conversion of agricultural lands to urban and built-up areas. From 2002 to 2008, about 279 thousand net acres of agricultural land (including additions and subtractions) were converted to urban and built-up areas in Southern California (Table 3.3.2). Regional conversion rates peaked from 2004 to 2006 at 47,532 acres. Santa Barbara County agricultural land was least affected by urban expansion. On the other hand, about 35 percent of the total land converted from 2002 to 2008 was in Riverside County, and San Bernardino and San Diego counties were each responsible for 19 percent of the acres converted.

Figure 3.3.1 shows how land use in central Riverside County's Coachella Valley changed from 2002 to 2008. The spread of urban areas (in red) over prime farmland (green) is evident in a southeastern direction. As these maps and the California Farmland Mapping and Monitoring Program indicate, conversion of prime farmland to dry farmland or pasture (yellow) generally precedes conversion to built-up areas.[3]

[3] Source: California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Coachella Valley area time series. Accessed June 2012: http://www.conservation.ca.gov/dlrp/fmmp/trends/TimeSeriesImg/Pages/Coachella.aspx

Table 3.3.1. Characteristics of Southern California farms, 2007

	Farms	Land in farms	Average	Harvested cropland	Pastureland[a]	Sales	Average	Crop sales	Livestock, poultry sales
	number	acres	acres	acres	acres	$ million	$ 1,000	$ million	$ million
Imperial	452	427,349	945	375,904	8,629	1,290	2,855	703	587
Los Angeles	1,734	108,463	63	25,829	51,275	326	188	302	24
Orange	325	87,435	269	7,846	(N/A)	336	1,035	334	3
Riverside	3,463	354,753	102	163,783	77,625	1,012	292	722	290
S. Bernardino	1,405	514,234	366	27,516	(N/A)	744	529	148	595
San Diego	6,687	303,889	45	67,279	151,973	1,054	158	961	93
Santa Barbara	1,597	727,050	455	93,280	560,171	951	596	913	38
Ventura	2,437	259,055	106	96,889	115,195	1,316	540	1,303	13
Southern California	**18,100**	**2,782,228**	**154**	**858,326**	**964,868**	**7,030**	**388**	**5,387**	**1,643**
State Total	**81,033**	**25,364,695**	**313**	**7,633,173**	**14,857,807**	**33,885**	**418**	**22,903**	**10,982**

Source: USDA, NASS. Census of Agriculture 2007. Accessed May 2012: http://www.agcensus.usda.gov/Publications/2007/Full_Report/

[a]Pastureland includes woodland and cropland pasture as well as permanent pasture and rangeland.

Note: Pastureland acreage in 2007 not reported for Orange and San Bernardino counties, although San Bernardino 2002 pastureland was reported as 426,384 acres.

Table 3.3.1A. Characteristics of Southern California farms as a share of all California farms, 2007

	Farms	Land in farms	Harvested cropland	Pasture-land	Sales	Crop sales	Livestock, poultry and products sales
				Percent			
Imperial	0.6	1.7	4.9	0.1	3.8	3.1	5.3
Los Angeles	2.1	0.4	0.3	0.3	1.0	1.3	0.2
Orange	0.4	0.3	0.1	(N/A)	1.0	1.5	0.0
Riverside	4.3	1.4	2.1	0.5	3.0	3.2	2.6
San Bernardino	1.7	2.0	0.4	(N/A)	2.2	0.6	5.4
San Diego	8.3	1.2	0.9	1.0	3.1	4.2	0.8
Santa Barbara	2.0	2.9	1.2	3.8	2.8	4.0	0.3
Ventura	3.0	1.0	1.3	0.8	3.9	5.7	0.1
Southern California	**22.3**	**11.0**	**11.2**	**6.5**	**20.7**	**23.5**	**15.0**
State Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: USDA, NASS. Census of Agriculture 2007. Accessed May 2012: http://www.agcensus.usda.gov/Publications/2007/Full_Report/

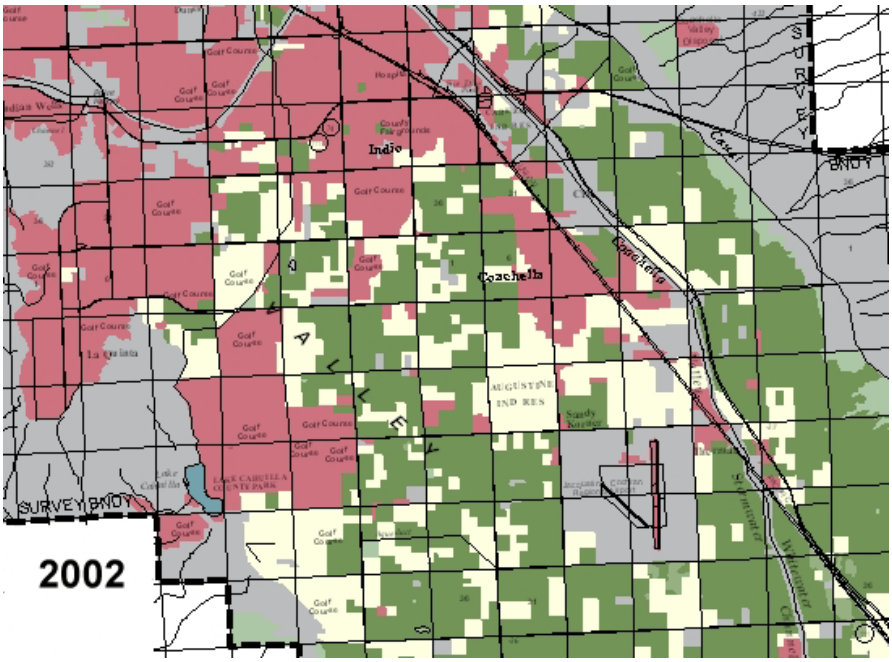
Table 3.3.2. Net acres converted to urban and built-up areas in Southern California, by county, 1992-2008[a]

	1992-94	1994-96	1996-98	1998-00	2000-02	2002-04	2004-06	2006-08	1992-2008
Imperial	702	431	454	366	853	1,186	539	812	**5,343**
Riverside	8,216	6,273	8,902	14,080	8,050	14,406	23,268	15,139	**98,334**
San Bernardino	4,685	5,577	2,376	2,918	12,133	9,314	9,419	7,005	**53,427**
Los Angeles	2,022	1,191	3,873	2,979	-1,827	2,757	4,551	2,881	**18,427**
Orange	3,042	1,896	7,740	3,397	4,609	4,191	2,066	3,614	**30,555**
San Diego	4,425	5,584	4,322	12,437	8,807	6,130	6,471	5,184	**53,360**
Santa Barbara	325	1,087	264	1,491	47	952	186	117	**4,469**
Ventura	2,419	1,542	2,639	1,713	2,557	2,052	1,032	1,408	**15,362**
Southern California	**25,836**	**23,581**	**30,570**	**39,381**	**35,229**	**40,988**	**47,532**	**36,160**	**279,277**

Source: California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Regional Conversion Summaries. March, 2011. Accessed June 2011: http://redirect.conservation.ca.gov/DLRP/fmmp/product_page.asp

[a] Acres converted include all agricultural land, including prime farmland, farmland of statewide importance, unique farmland, grazing land, farmland of "local importance" to the local agricultural economy as determined by the counties, low-density rural developments, and other land such as vegetative and riparian areas not suitable for livestock grazing, borrow pits, vacant and non-agricultural land greater than 40 acres and surrounded on all sides by urban development, and confined animal facilities. Also includes water bodies.

Figure 3.3.1. Land conversion in Central Coachella Valley, Riverside County, 2002 and 2008



Source: California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Coachella Valley area time series. Accessed June 2012: http://www.conservation.ca.gov/dlrp/fmmp/trends/TimeSeriesImg/Pages/Coachella.aspx

Legend: Green= farmland; yellow= dry farmland, irrigated pasture and dairy land; red=urban and built-up land; grey=other land.

3.4 Value of Agricultural Production

Using County Agricultural Commissioners' data, we estimate that the Southern California counties produced $8.2 billion (18%) of the state's $46.2 billion of agricultural value in 2010.[4] Adjusted for inflation, in 2005 dollars the value of Southern California agriculture is $7.4 billion. Over the last three decades, the real value of agricultural production in Southern California has shown no apparent overall trend (Figure 3.4.1). Total production has ranged from $7.8 billion in 1990 to $6.6 billion in 1992, though since the mid-1990s, production has generally stayed above $7 billion. The 11 percent drop in Southern California farming from 1991 to 1992 was not apparent in the rest of the state and may have been the result of several years of ongoing drought. Mainly fruit, nut, and poultry product sales were affected.

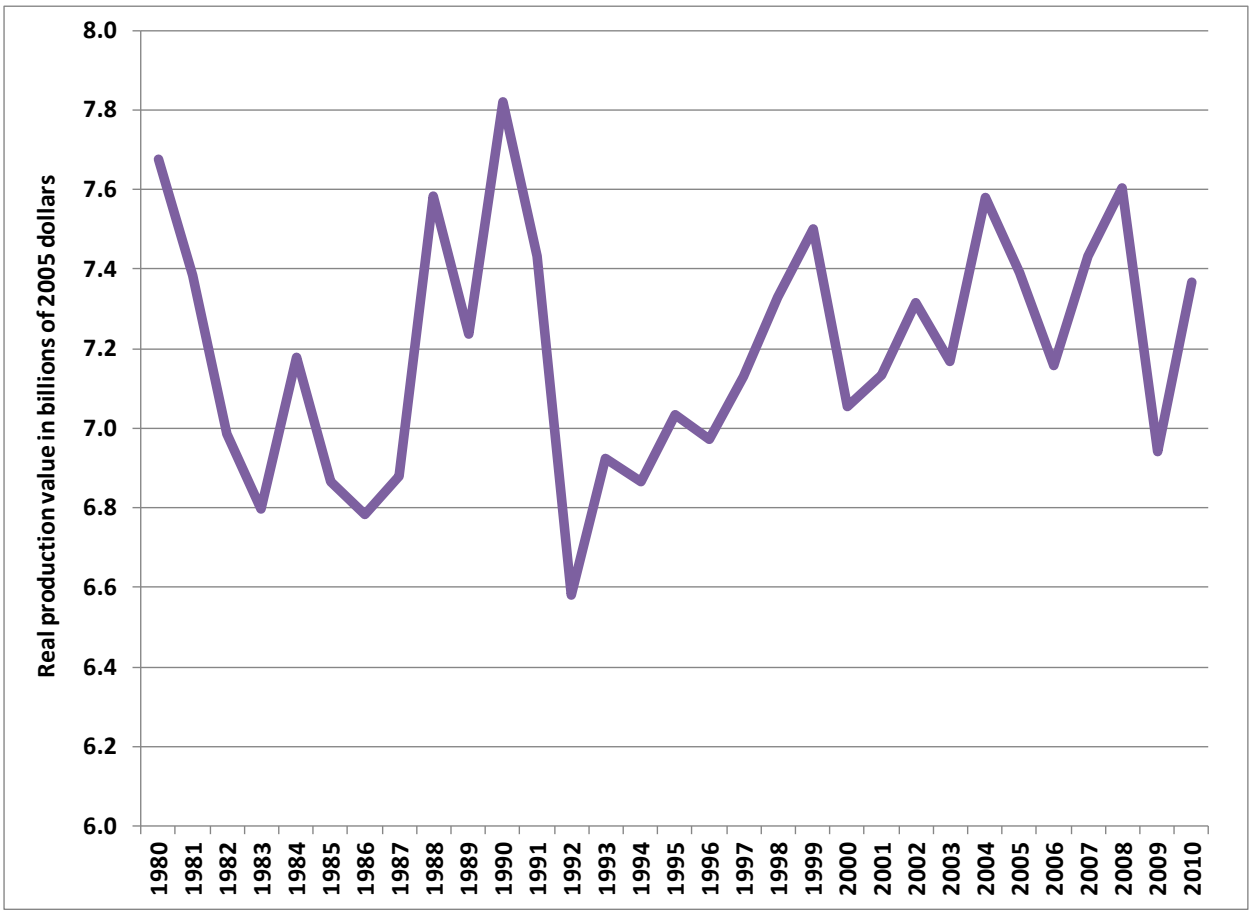
However, in each of the southern counties, real agricultural production value has shown very different trends, as shown in Figures 3.4.1A and 3.4.1B. In Riverside, San Bernardino, Los Angeles and Orange counties, production value has been falling for three decades, whereas Ventura and Santa Barbara production continually increased. San Diego County experienced an agricultural boom in 1989 and 1990, and has grown slowly ever since. Production value in Imperial County has been on an upward trend for the past decade after declining for the previous 20 years.

Southern California agriculture is responsible for about 18 percent of the state's farm production value (Table 3.4.1). One-quarter of California's vegetables come from the southern part of the state. The region also produced $1.9 billion, or 56 percent of the state value, in nursery, flowers and foliage. Most of this production occurred in San Diego County, which alone produced 33 percent of the state nursery output.

Within Southern California agriculture, several important commodity groups comprise the majority of agricultural production value in the region. About 29 percent of Southern California agricultural output was fruit and nut crops, and approximately 28 percent was vegetables (Figure 3.4.2). Another 23 percent of production value was from the greenhouse and nursery industry. Livestock and livestock products contribute 13 percent of Southern California production value, which is nearly double the value share for field and seed crops.

[4] See Table 3.4.3 and Appendix A: The state total represents the sum of Commissioners' data from each county, and so may be an overestimate. In contrast, CDFA/NASS estimates state cash receipts from agriculture to be $37.6 billion in 2010.

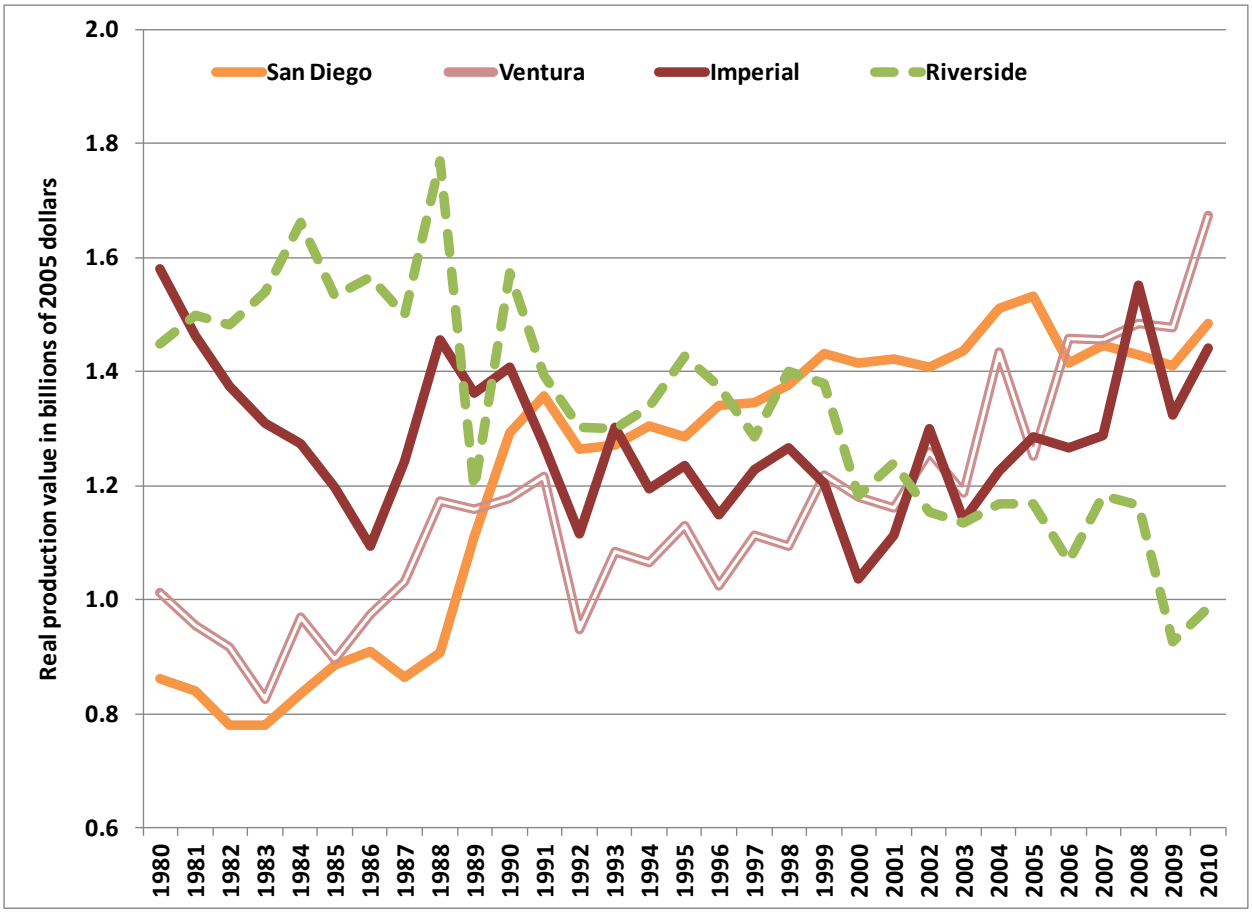
Figure 3.4.1. Southern California real (2005 dollar) value of agricultural production, 1990-2010



Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, various. Accessed May 2012:
http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

Bureau of Economic Analysis GDP price deflator, year 2005=100.
http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

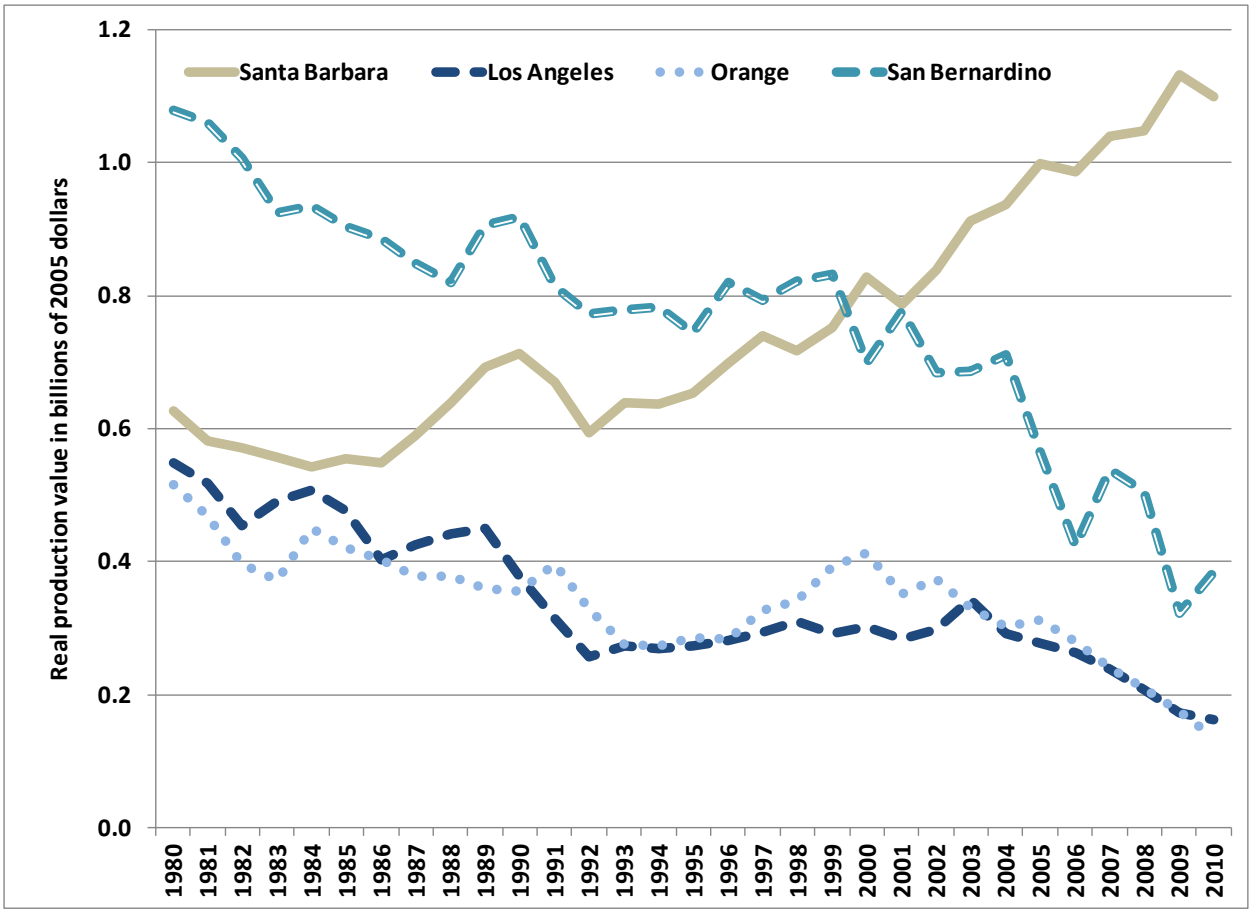
Figure 3.4.1A. Real (2005 dollar) value of agricultural production in Southern California counties, 1990-2010



Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, various. Accessed May 2012:
http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

Bureau of Economic Analysis GDP price deflator, year 2005=100.
http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

Figure 3.4.1B. Real (2005 dollar) value of agricultural production in Southern California counties, 1990-2010



Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, various. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

Bureau of Economic Analysis GDP price deflator, year 2005=100. http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

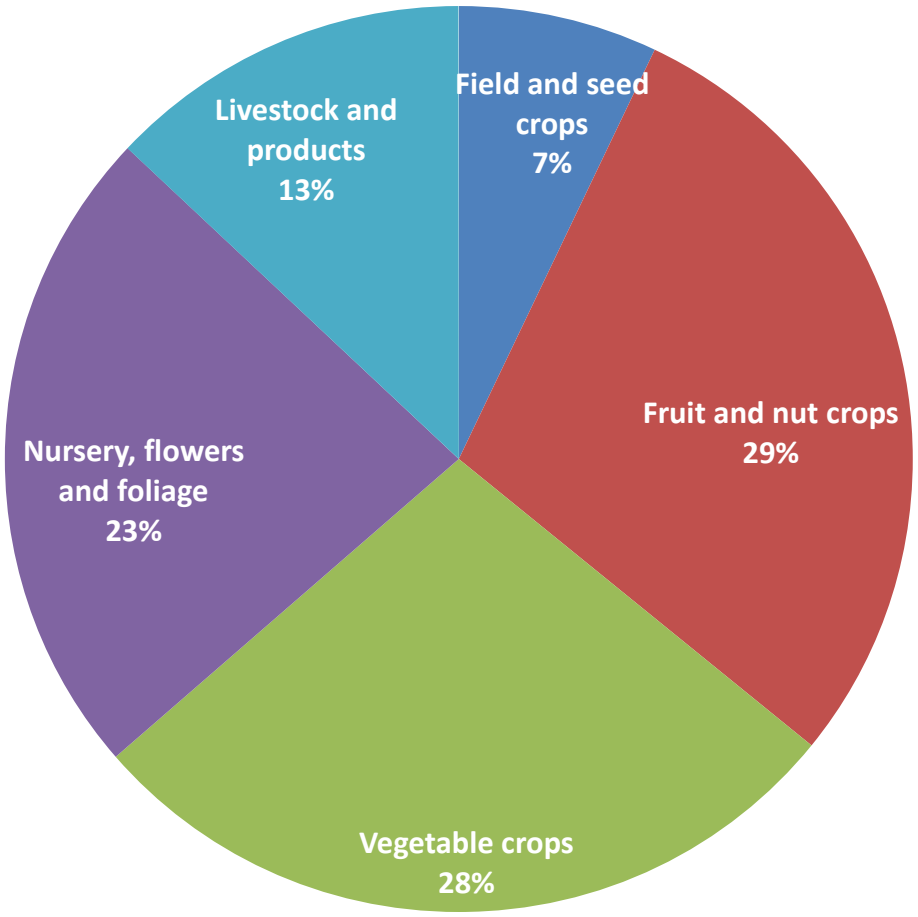
Table 3.4.1. Share of total California value of agricultural production in Southern California counties, 2010

	Field and seed crops	Fruit and nut crops	Vege-table crops	Nursery, flowers, foliage	Livestock and products[a]	All Commodities
				Percent		
Imperial	7.8	0.3	8.9	0.1	3.0	3.5
Los Angeles	0.3	0.1	0.4	3.2	0.1	0.4
Orange	0.0	0.2	0.2	2.7	0.0	0.3
Riverside	1.7	1.8	3.0	5.0	2.2	2.4
San Bernardino	0.3	0.1	0.3	0.8	3.1	0.9
San Diego	0.1	1.5	1.9	32.6	1.0	3.6
Santa Barbara	0.3	3.2	4.9	5.2	0.3	2.6
Ventura	0.1	6.2	5.9	6.7	0.1	4.0
Southern California Total	**10.7**	**13.4**	**25.5**	**56.4**	**9.7**	**17.7**

Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

[a]Includes apiary.

Figure 3.4.2. Value of agricultural production in Southern California by commodity group, 2010

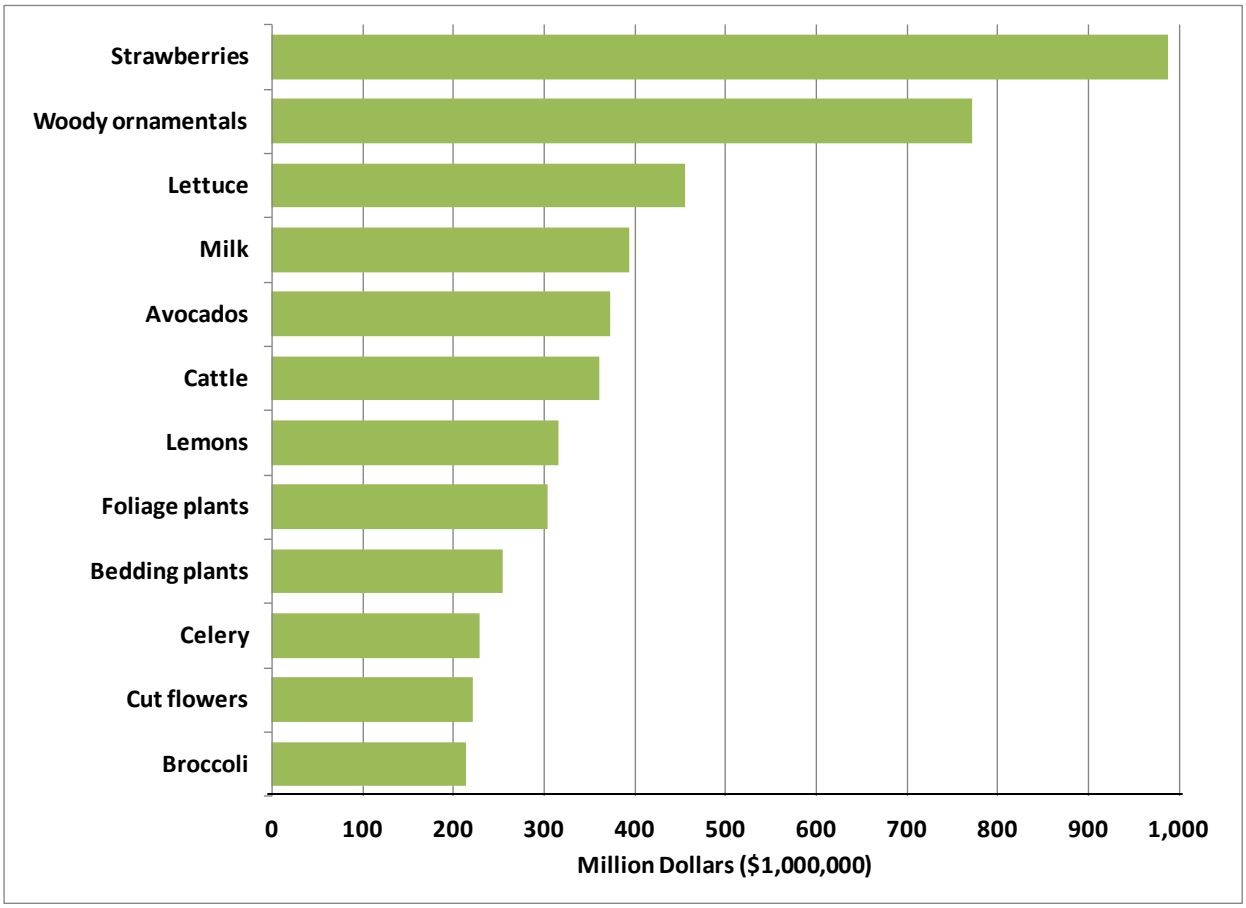


Source: Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

With $988 million in value, the top Southern California commodity in 2010 was strawberries, followed by woody ornamental nursery products ($772 million), and lettuce ($456 million) (Figure 3.4.3). Milk, in fourth place, is the top livestock product, with cattle ranking sixth. With $373 million in 2010 output, avocados are the fifth most valuable commodity in Southern California and the top tree crop in southern California.

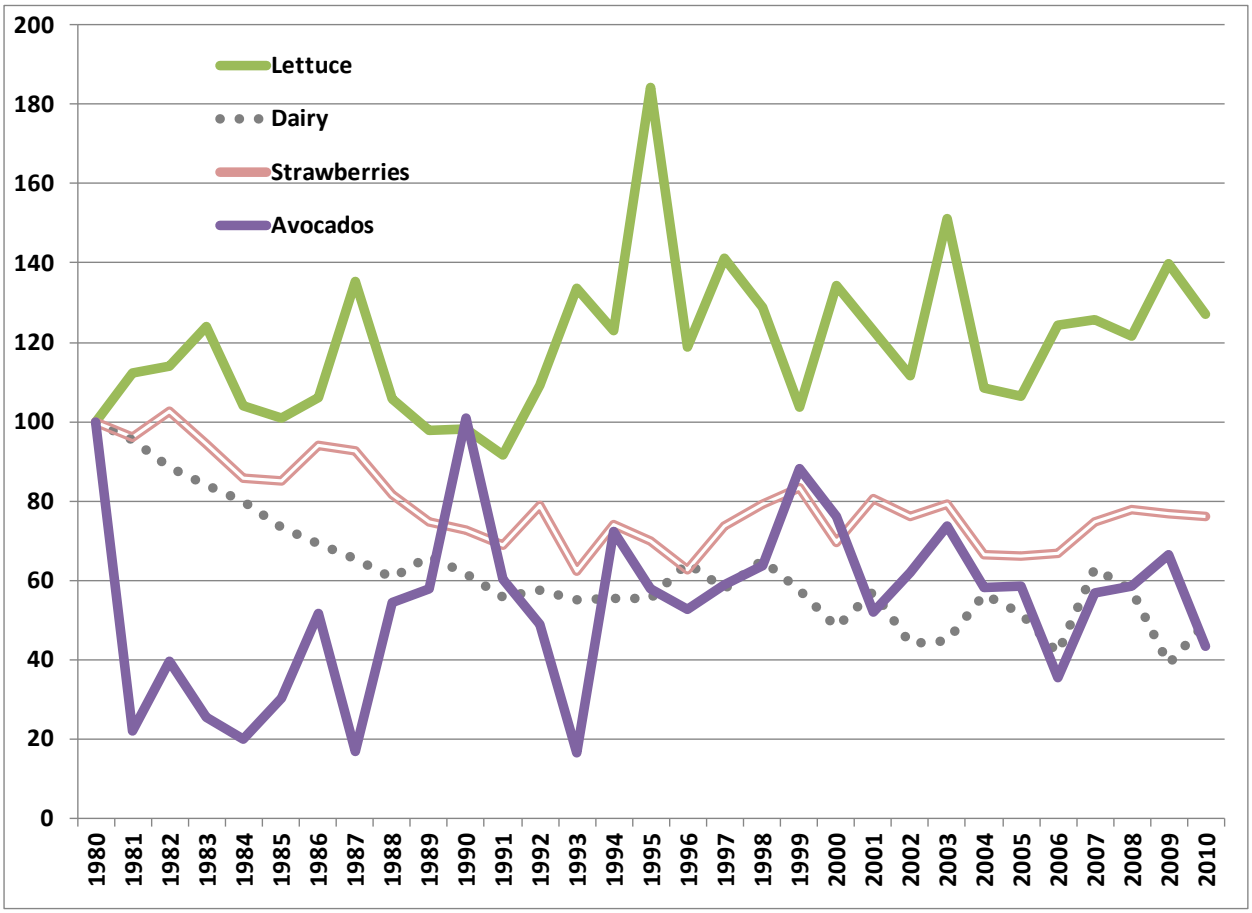
Real California prices for the top five Southern California commodities reveal that each commodity faces distinctly different market environments. While strawberry prices have fallen over time to about 76 percent of 1980 prices, lettuce prices have increased to about 30 percent higher than 1980 prices (Figure 3.4.4). California dairy prices have fallen by about 50 percent over the last thirty years, albeit with increasing volatility. Avocado prices were highly variable in the 1980s and early 1990s, and have since fluctuated between 80 and 40 percent of 1980 prices in real terms.

Figure 3.4.3. Top 12 commodities in Southern California by value of production, 2010



Source: Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

Figure 3.4.4. Index of real (2005 dollar) California prices for top Southern California commodities (1980=100)



Source: USDA, NASS (2012). Statistics by State, California Historical Data. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Historical_Data/index.asp

Bureau of Economic Analysis GDP price deflator, year 2005=100. http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

Delving further into the top commodities and agricultural regions in Southern California, we see that the coastal counties of Ventura, Santa Barbara and San Diego and the inland counties of Imperial and Riverside account for about 90 percent of the farm production value in the region (Table 3.4.2). Ten percent of value comes from the remaining three counties—Los Angles, Orange and San Bernardino. The commodity mix differs greatly across counties. An amalgam of nursery plants, fruits, vegetables and livestock products comprise the list of top-valued Southern California commodities shown in Table 3.4.2. Further county, regional, and state-level details for individual commodities and commodity groups are presented in Table 3.4.3.

Nursery and floriculture production together generate $1.9 billion in production value in 2010. About 58 percent of this output occurs in San Diego County, but significant production also occurs in the other coastal counties and in Riverside County. The majority of agricultural production value in the highly urban Los Angeles and Orange counties derives from nursery and flower production.

Fruit crops are key contributors to the value of agriculture along the coast and in Riverside County. Of the nearly $1 billion in strawberry production, Ventura County produces $542 million and Santa Barbara County produces $355 million. Ventura and San Diego counties together generate nearly 80 percent of the value of avocados in Southern California. Lemon production is significant for the region as a whole, but is mostly concentrated in Ventura. Finally, Riverside and Santa Barbara each produce about $100 million in grapes. Many other, smaller fruit industries are scattered throughout the region and are listed in aggregate below. For example, Ventura County produces $221 million of other fruits such as raspberries and oranges.

Vegetable production in Southern California is widely dispersed. Lettuce is the top commodity in Imperial County, with about $300 million in production value. The lettuce industry is also significant in Santa Barbara County. Celery and tomato production occurs mainly in Ventura, while large amounts of broccoli are grown in Santa Barbara and Imperial. Myriad other individual vegetables and melons, including onions, carrots and cantaloupes, together make up a large share of Imperial County production value.

Production of field crops, livestock and livestock products is concentrated mainly in the inland counties. Imperial County grows about three-fourths of the hay and other field crops in Southern California, and produces the bulk of the cattle ($268 million in feedlot production). The dairy industry is also important to Southern California, with $241 million of milk produced in San Bernardino County and $146 million in Riverside County. The $193 million egg industry is located in Riverside, San Bernardino and San Diego counties.

Table 3.4.2. Top Southern California commodities by county production value, 2010[a]

	Imperial	Los Angeles	Orange	Riverside	San Bern-ardino	San Diego	Santa Barbara	Ventura
				($ millions)				
Nursery and flowers	4.1	107.9	90.0	169.3	28.7	1,107.6	178.1	227.4
Strawberries	-	0.8	29.6	10.2	1.3	11.5	355.2	542.1
Lettuce	301.3	-	-	36.6	-	2.5	101.3	14.0
Milk	-	-	-	145.6	240.8	7.9	-	-
Avocados	-	0.2	-	23.6	1.4	147.1	52.1	148.3
Cattle	267.5[b]	-	-	15.2	40.6	16.2	20.8	-
Lemons	19.7	-	-	69.0	0.8	39.0	12.7	174.8
Celery	-	-	-	5.6	-	-	40.8	182.3
Broccoli	75.3	-	0.04	11.4	-	-	122.5	4.1
Tomatoes (all)	-	-	0.2	1.5	0.1	86.8	-	120.1
Grapes[c]	-	-	-	99.5	0.4	0.8	97.4	-
Chicken eggs	-	-	-	71.3	45.7	75.9	-	-
Hay	228.8	-	-	54.8	11.8	1.0	2.9	-
Other field and seed crops	194.3	14.7	0.9	39.6	5.4	5.0	13.3	7.4
Other fruits and nuts	31.6	17.4	13.2	113.4	17.7	59.9	40.8	220.5
Other vegetables and melons	418.4	31.1	16.1	213.6	23.2	79.6	171.7	208.1
Other livestock and products	57.5	7.7	0.3	13.4	9.3	7.8	10.5	7.7
All commodities	**1,598.5**	**179.8**	**150.4**	**1,093.7**	**427.6**	**1,648.6**	**1,220.0**	**1,856.7**

Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

[a]Commodities are in approximate ranking order by total Southern California county production value.
[b]Feedlot cattle only, as reported by the Imperial County Agricultural Commissioner.
[c]Grapes include table and wine grapes.

Table 3.4.3. Value of agricultural production for selected Southern California commodities, by county, 2010

	Imperial	Los Angeles	Orange	Riverside	San Bernardino
			($1,000)		
Animal Products	**325,023**	**7,669**	**266**	**245,480**	**336,689**
Milk	-	-	-	145,618	240,837
Cattle	267,510	-	-	15,237	40,556
Chicken eggs	-	-	-	71,323	45,668
Field & Seed Crops	**423,087**	**14,678**	**936**	**94,385**	**17,238**
Alfalfa hay	129,227	-	-	47,304	7,772
Seeds for sowing	49,041	-	-	-	-
Fruits & Nuts	**51,294**	**18,412**	**42,760**	**315,716**	**21,646**
Table grapes	-	-	-	92,187	28
Wine grapes	-	-	-	7,339	337
Oranges	-	-	-	13,810	13,586
Strawberries	-	849	29,557	10,220	1,328
Lemons	19,691	-	-	68,959	760
Grapefruit	1,734	-	-	35,446	698
Raspberries	-	-	-	-	-
Dates	20,789	-	-	36,537	-
Tangerines & mandarins	735	-	-	15,242	-
Avocados	-	185	-	23,551	1,448
Vegetables	**794,984**	**31,104**	**16,369**	**268,729**	**23,346**
Lettuce	301,312	-	-	36,593	-
Broccoli	75,298	-	35	11,431	-
Carrots	64,225	-	-	12,252	-
Tomatoes	-	-	155	1,463	73
Celery	-	-	-	5,604	-
Onions	76,069	-	23	1,105	-
Cauliflower	26,964	-	17	7,819	-
Spinach	20,407	-	-	2,007	-
Bell peppers	-	-	-	89,904	-
Cabbage	6,881	-	-	393	10,910
Melons	73,721	-	-	21,141	-
Artichokes	-	-	-	5,034	-
Mushrooms	-	-	-	-	-
Nursery & flowers	**4,146**	**107,891**	**90,043**	**169,342**	**28,660**
Woody ornamentals	-	51,282	73,747	131,471	11,496
Bedding plants	-	37,813	-	-	1,626
Cut flowers & foliage	-	-	1,014	3,134	-
Foliage plants	-	3,418	-	-	6,669
All commodities	**1,598,534**	**179,753**	**150,374**	**1,093,651**	**427,579**

Table 3.4.3. Value of agricultural production for selected Southern California commodities, by county, 2010 – continued

	San Diego	Santa Barbara	Ventura	Southern California	California Total
			($1,000)		
Animal Products	**107,765**	**31,265**	**7,666**	**1,061,823**	**10,940,569**
Milk	7,890	-	-	394,345	5,539,301
Cattle	16,249	20,760	-	360,312	2,580,905
Chicken eggs	75,905	-	-	192,896	348,668
Field & Seed Crops	**6,004**	**16,182**	**7,354**	**583,905**	**5,090,071**
Alfalfa hay	-	765	-	185,068	902,615
Seeds for sowing	-	2,862	-	51,903	202,279
Fruits & Nuts	**258,319**	**558,195**	**1,085,677**	**2,352,019**	**17,487,327**
Table grapes	-	-	-	92,215	1,288,771
Wine grapes	785	97,375	-	105,836	2,458,805
Oranges	13,662	-	31,740	72,798	1,178,778
Strawberries	11,463	355,203	542,127	950,747	2,067,187
Lemons	38,986	12,729	174,766	315,891	441,189
Grapefruit	13,836	-	578	52,292	70,786
Raspberries	-	-	167,446	167,446	301,602
Dates	-	-	-	57,326	58,526
Tangerines & mandarins	4,130	-	5,805	25,912	321,012
Avocados	147,052	52,063	148,343	372,642	418,342
Vegetables	**168,917**	**436,288**	**528,582**	**2,268,319**	**8,886,552**
Lettuce	2,511	101,346	13,988	455,750	2,067,248
Broccoli	-	122,536	4,148	213,448	647,822
Carrots	-	-	3,118	79,595	514,380
Tomatoes	86,775	-	120,085	208,551	1,597,828
Celery	-	40,795	182,268	228,667	436,252
Onions	-	-	1,675	78,872	324,410
Cauliflower	-	47,699	-	82,499	206,072
Spinach	-	9,773	11,680	43,867	212,734
Bell peppers	3,114	3,092	45,364	141,474	276,273
Cabbage	-	4,844	22,431	45,459	135,811
Melons	326	-	-	95,188	338,660
Artichokes	-	-	-	5,034	53,526
Mushrooms	12,292	-	-	12,292	174,760
Nursery & flowers	**1,107,558**	**178,116**	**227,405**	**1,913,161**	**3,393,652**
Woody ornamentals	418,842	-	84,670	771,508	956,878
Bedding plants	214,941	-	-	254,380	325,224
Cut flowers & foliage	77,317	98,749	41,737	221,951	385,038
Foliage plants	292,500	1,025	-	303,612	339,574
All commodities	**1,648,563**	**1,219,996**	**1,856,684**	**8,175,134**	**46,151,198**

Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

4. Broad Impacts of Southern California Agriculture on Employment and the Economy

This chapter uses data from previous chapters and a well-known model to quantify how farming and the rest of agriculture contributes to economic activity in Southern California agriculture. These impacts differ by county and sub-region and are important in many contexts.

4.1 Measuring Economic Effects[5]

Agriculture creates significant ripple effects throughout Southern California's economy. Each dollar earned within agriculture fuels a more vigorous economy by stimulating additional activity in the form of jobs, labor income and value added.

The Agricultural Issues Center utilized the IMPLAN Pro® version 3.0 software and accompanying 2010 dataset to determine the multiplier effects of agriculture on the economy. IMPLAN (IMpact Analysis for PLANning) utilizes an input-output model developed by the U.S. Department of Agriculture Forest Service to quantify the interrelationships between the economic sectors in the state and regional economies [see Appendix B].

For any given industry, IMPLAN enables quantification of output, employment, labor income and value added both before and after taking into account the ripple effects on the entire economy. Not including ripple effects, the direct effects of an industry are expressed as dollar values or number of jobs. IMPLAN measures output as total industry sales, or in the case of farming, value of production. Employment is represented as the number of jobs directly employed by a particular industry. Labor income consists of the employee compensation (wages and salaries) and proprietary income paid to workers in an industry. Value added can be considered as industry sales minus the cost of purchased inputs and services. Another way to calculate value added is to sum labor income, property income, and indirect business taxes (general sales and excise taxes). Ripple effects for employment, labor income and value added are expressed as industry multipliers.

Ripple or total effects are composed of three types of effects—direct, indirect and induced. Direct effects measure the direct outputs of a particular industry and thus are

[5] Much of this section and its findings are from the UC Agricultural Issues Center's *The Measure of California Agriculture 2012*, which is yet unpublished as of June, 2012. Previous versions are available at aic.ucdavis.edu.

determined directly by that industry's inputs. Indirect effects are the secondary inter-industry effects that one industry has on another. For example, increases in fertilizer purchase by the vegetables subgroup indirectly results in the production of additional fertilizer, the usage of additional natural gas to produce the fertilizer, and increased production and transport of the gas.[6] These direct and indirect effects result in changes in population and income, which in turn affect household consumption. Induced effects are the changes in household consumption of goods and services measured in employment, income and value added.

The industry multipliers are essentially the ratio of total effects to direct effects for each industry. Industry multipliers are typically a ratio close to 2. For example, for the California agricultural production and processing industry there is a value-added multiplier of 2.63 (Table 4.1.1B). Thus, for every dollar of value added in that sector, there is an additional $1.63 added to the regional economy. The California employment multiplier for agricultural production and processing is 3.33, meaning that each job within that industry generates 2.33 other jobs in the regional economy.

There is an important caveat when interpreting the multiplier effects of particular industries. The total effects (direct, indirect and induced) and industry multipliers for aggregated subgroups are not equivalent to the sums of the individual subgroups. Agricultural activities are related in many ways, so when regional economic impacts of one industry are measured, effects associated with the production of other industries are also incorporated. Thus, one industry's output becomes another industry's input. To avoid double counting, each industry must be separately analyzed to determine a unique "net effect" on the regional economy. This is why the total economic effect of farming is not the sum of the effects of each of the subgroups—field crops, vegetables, fruits, dairy, etc.

Multiplier effects differ by commodity because the production of some commodities may be related to more input and processing industries located within the state or region than others. Multipliers may also differ by region due to geographic dispersion of industries related to agriculture, differences in aggregate size of agriculture and type of commodities produced in that region. In addition, state multiplier effects do not reflect interactions with industries located out of state. Some industries may have a greater impact at the regional level, while other industries may have broader geographic impacts, which are not included in the IMPLAN analysis for California.

[6] Our analysis is limited by the data available for use with IMPLAN®, including their industry aggregations.

Our chosen industry aggregations encompass many agricultural sectors under several broad headings. Farming includes all available crop and animal industry subcategories, such as fruit and beef cattle, which are individually displayed in our results. Agricultural support activities consist of a number of activities closely related to agricultural production, some on-farm and some off. Only support activities that are managed by independent firms and not by the farm's operator are reported here. For example, support activities include soil preparation and packing and cooling of agricultural products when these are contracted out, but do not include these activities when done by the farm's operator. On-farm contract labor constitutes a large part of the support activity group. Finally, the agricultural processing heading encompasses several dozen industries involved in food, animal feed and beverage manufacturing. Some examples are frozen food manufacturers, cheese manufacturers, sugar refineries, canneries, cat food manufacturers and wine producers.

As shown in Table 4.1.1A, in 2009, California's agricultural production and processing industry accounted for 4.6 percent of state output, 3.0 percent of jobs, 2.6 percent of labor income, and 2.3 percent of value added. When taking into account direct, indirect and induced effects, the measured share of agricultural production and processing increased to 6.7 percent of the 20 million jobs in the state, 6.1 percent of the state labor income, and 6.0 percent of the state value added. The total effects from agricultural processing alone accounted for 3.3 percent of state employment, 3.4 percent of labor income and 3.4 percent of value added in the state economy.

Farming directly accounted for 1.3 percent (i.e. $40.9 billion) of the state output. The direct, indirect and induced effects of farming accounted for 2.1 percent (about 424 thousand jobs) of employment in California, 2.0 percent ($22.6 billion) of labor income, and 1.9 percent ($35.6 billion) of value added. The highest valued subgroup within farming—fruits—was worth $12 billion in 2009, or 0.4 percent of the state output. After including indirect and induced effects, fruits accounted for 0.7 percent of state employment, 0.8 percent of labor income and 0.6 percent of value added. The vegetable and melon industry, the second largest group within farming, accounted for nearly $5 billion in labor income and nearly 85 thousand jobs. Similarly, the dairy industry constituted 0.2 percent of state employment, 0.1 percent of labor income and 0.2 percent of value added when accounting for ripple effects.

Table 4.1.1.A. Economic impact of California's agricultural production and processing, 2009
California: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	147,008	589,794	29,919	42,593	1,323,238	70,681	112,048
Agricultural processing[h]	98,271	197,554	12,003	20,450	657,950	39,484	64,441
Forestry, fishing, hunting	1,266	10,375	351	563	17,301	671	1,054
Ag-support activities[i]	6,578	187,195	5,978	5,174	227,459	8,032	8,799
Farming	40,893	194,670	11,587	16,407	424,249	22,628	35,563
Grains & oilseeds	1,345	16,200	128	501	22,676	413	1,027
Cotton	304	997	51	124	2,647	126	253
Vegetables & melons	8,001	28,997	2,506	3,642	84,528	4,973	7,699
Fruit	11,776	48,383	4,530	5,455	147,662	8,868	12,057
Tree nuts	3,651	29,164	1,469	1,891	57,817	2,729	3,834
Greenhouse & nursery	4,010	21,178	1,844	2,010	45,069	3,072	4,022
Other crops	4,006	13,803	588	1,174	38,692	1,719	3,114
Beef cattle	1,671	8,633	93	253	16,079	430	897
Dairy cattle & milk	4,534	20,604	207	983	40,925	1,244	2,815
Poultry and eggs	1,280	1,644	128	236	6,942	416	728
Other animals	316	5,067	44	138	6,334	103	243
Total California economy	3,223,297	19,856,985	1,159,872	1,874,562			

Notes for Table 4.1.1.A.

Source: UC Agricultural Issues Center, using IMPLAN® Version 3.0 software package and 2009 dataset (2012).

[a]Nominal (2009) dollars.
[b]Total effects include direct, indirect and induced effects of the named industry.
[c]Values that utilize multiplier effects are not additive and thus cannot be aggregated to get totals.
[d]Industry output: value of production (i.e. total sales) of the named industry.
[e]Employment: number of jobs directly employed by the corresponding industry.
[f]Labor income: value of wages and salaries and other proprietary income paid by the industry.
[g]Value added equals the sum of labor income (employee compensation and proprietor income), property income and indirect business taxes. This is equivalent to total sales (industry output) less purchased inputs and services.
[h]This group includes animal feed, food and beverage industries.
[i]Agricultural support activities includes contract labor, fertilizer and pesticides manufacturing, soil preparation and harvesting services, packing and cooling, cotton ginning, and animal production services.

Table 4.1.1.B. Economic impact of California's agricultural production and processing, 2009
California: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production & processing	2.24	2.36	2.63
Agricultural processing	3.33	3.29	3.15
Forestry, fishing, hunting	1.67	1.91	1.87
Ag-support activities	1.22	1.34	1.70
Farming	2.18	1.95	2.17
Grains and oilseeds	1.40	3.22	2.05
Cotton	2.66	2.47	2.04
Vegetables and melons	2.92	1.98	2.11
Fruit	3.05	1.96	2.21
Tree nuts	1.98	1.86	2.03
Greenhouse and nursery	2.13	1.67	2.00
Other crops	2.80	2.92	2.65
Beef cattle	1.86	4.62	3.54
Dairy cattle and milk	1.99	6.01	2.86
Poultry and eggs	4.22	3.25	3.08
Other animals	1.25	2.35	1.76

Source: see Table 4.1.1.A.

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

4.2 Economic Impacts of Southern California Agriculture

For the purposes of our study, the Southern California agricultural region consists of eight counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara and Ventura. We consider the economic impacts of Southern California agriculture as both an eight-county total and, where specifically noted, as a total of the central counties excluding Imperial and Santa Barbara. Each county's impacts are explored in more detail in individual case studies.

Besides geographical case studies, we also consider the Southern California market for strawberries, woody ornamental nursery products, lettuce, dairy and avocados, all of which are key commodities for the region. Since IMPLAN does not model the impacts of individual commodities, multiplier effects are applied to each commodity based on the most specific industry aggregation available (i.e. "fruit" for avocados).

Our analysis of Southern California agricultural impacts is based on the IMPLAN 2010 data set. We also conducted a complete analysis of the region and its counties using the 2009 data set and found that both years are consistent, showing only small changes due to annual variation and nothing outstandingly odd or unique in the multipliers or direct industry effects. Thus, we have greater confidence in the validity of our results and can make more robust conclusions about Southern California agriculture now and in the near future.

In 2010, the total economy of Southern California (consisting of eight counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara and Ventura) generated $1.75 trillion in industry output and employed over 11 million people (Table 4.2.1A). Total value added in the economy was $1.08 trillion and labor income was $648.6 billion. Agricultural industries, including farming, agricultural support activities, forestry, fishing, hunting, and agricultural processing, produced $47.6 billion in sales and supplied $9.6 billion in labor income to 156 thousand agricultural workers in 2010. Accordingly, agricultural industries represented 2.7 percent of Southern California output, 1.4 percent of employment, 1.5 percent of labor income, and 1.3 percent of value added. Accounting for direct, indirect and induced effects, the agricultural industry generated 447 thousand jobs and $42.3 billion in value added in the regional economy. These totals each represent 3.9 percent of the jobs and value added in all of Southern California.

Within agricultural industries, processing had the greatest impact on the Southern California economy. Agricultural processing, including food, feed and beverage manufacturing, produced $36.8 billion in sales and employed 0.7 percent of Southern

California workers. Value added is particularly important for this industry. Processing value added was $8.8 billion including direct effects only, and $27.9 billion when ripple effects are included.

Southern California farming, including crop and animal production, created $9.1 billion in production value. (Compared to 2009 farming in the state as a whole, Southern California comprises about 22 percent of farming output.) Farming industries employed 41 thousand Southern Californians in 2010. In contrast, regional agricultural support activities employed 37 thousand people and generated only $1.4 billion in sales.

Fruit production had the highest sales and employment of all farming industries with $2.5 billion in output and 13 thousand employees, or 0.1 percent of each measure for all Southern California industries. Greenhouse and nursery farming was second in sales and employment, but had the most labor income ($1.3 billion) and value added ($1.4 billion). However, when accounting for ripple effects, fruit farming creates the most labor income and value added in the broader economy.

Multiplier effects for Southern California agricultural industries are presented in Table 4.2.1B. We can see that the employment multiplier for agricultural production and processing is 2.86, meaning that every job within the agricultural sector creates 1.86 jobs in other industries. The labor income multiplier for Southern California agricultural industries is 2.65. For every dollar of labor income in agriculture, $1.65 is earned elsewhere in the economy. Similarly, for value added, the multiplier is 2.92. Southern California value added from the direct, indirect and induced effects of agricultural production and processing is 2.92 times that of value added directly by the sector.

Multiplier effects vary significantly by industry. Agricultural processing has relatively high employment, labor income and value added multipliers, in the range of 3.0 to 4.0. In contrast, multipliers for agricultural support activities are below 2, indicating that these activities do not have substantial economic impacts outside of agriculture. The Southern California farming employment multiplier was 2.69, with individual farming industry multipliers ranging from 5.25 for poultry and eggs to 1.30 for other animals. The labor income multiplier for dairy production was 6.57, significantly higher than any other agricultural industry, in part because the California dairy production is year-round, requiring longer-term employees than in more seasonal industries. Value added effects were high among grains, oilseeds and cotton.

Table 4.2.1.A. Economic impact of Southern California's agricultural production and processing, 2010
Southern California: 8 Counties: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects Employment[e]	Direct Effects Labor income[f]	Direct Effects Value added[g]	Total Effects[b,c] Employ-ment	Total Effects[b,c] Labor income	Total Effects[b,c] Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	47,626	156,240	9,560	14,478	446,846	25,334	42,276
Agricultural processing[h]	36,840	74,568	4,844	8,827	288,578	15,840	27,893
Forestry, fishing, hunting	268	3,296	85	119	5,340	174	262
Ag support activities[i]	1,448	37,401	1,133	1,110	48,621	1,677	2,087
Farming	9,071	40,976	3,498	4,423	110,225	6,716	10,261
Grains & oilseeds	73	626	7	15	1,202	30	64
Cotton	20	68	3	4	242	10	17
Vegetables & melons	1,840	6,838	749	937	24,207	1,513	2,268
Fruit	2,506	13,393	1,132	1,333	40,179	2,287	3,226
Tree nuts	17	217	7	9	384	14	21
Greenhouse & nursery	2,122	10,528	1,296	1,407	28,741	2,190	2,955
Other crops	981	2,702	208	307	11,294	591	998
Beef cattle	518	1,720	28	86	4,248	147	320
Dairy cattle & milk	592	2,818	24	217	5,467	158	460
Poultry & eggs	286	319	29	52	1,675	102	177
Other animals	115	1,747	16	56	2,271	41	100
Total Southern California economy	1,747,789	11,453,312	648,569	1,076,127			

Source: UC Agricultural Issues Center, using IMPLAN® Version 3.0 software package and 2010 dataset (2012).

Notes for Table 4.2.1.A:

[a]Nominal (2009) dollars.

[b]Total effects include direct, indirect and induced effects of the named industry.

[c]Values that utilize multiplier effects are not additive and thus cannot be aggregated to get totals.

[d]Industry output: value of production (i.e. total sales) of the named industry.

[e]Employment: number of jobs directly employed by the corresponding industry.

[f]Labor income: value of wages and salaries and other proprietary income paid by the industry.

[g]Value added equals the sum of labor income (employee compensation and proprietor income), property income and indirect business taxes. This is equivalent to total sales (industry output) less purchased inputs and services.

[h]This group includes animal feed, food and beverage industries.

[i]Agricultural support activities includes contract labor, fertilizer and pesticides manufacturing, soil preparation and harvesting services, packing and cooling, cotton ginning, and animal production services.

Table 4.2.1.B. Economic impact of Southern California's agricultural production and processing, 2010

Southern California: 8 Counties: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production & processing	2.86	2.65	2.92
Agricultural processing	3.87	3.27	3.16
Forestry, fishing, hunting	1.62	2.05	2.20
Ag-support activities	1.30	1.48	1.88
Farming	2.69	1.92	2.32
Grains and oilseeds	1.92	4.35	4.29
Cotton	3.56	3.43	4.36
Vegetables and melons	3.54	2.02	2.42
Fruit	3.00	2.02	2.42
Tree nuts	1.77	2.01	2.30
Greenhouse and nursery	2.73	1.69	2.10
Other crops	4.18	2.84	3.25
Beef cattle	2.47	5.26	3.72
Dairy cattle and milk	1.94	6.57	2.12
Poultry and eggs	5.25	3.51	3.40
Other animals	1.30	2.56	1.79

Source: see Table 4.2.1. A.

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

Considering Southern California as a total of six counties (Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura), and excluding Imperial and Santa Barbara counties, we see that total regional output becomes $1.71 trillion and value added becomes $1.05 trillion (Table 4.2.2A). Under this smaller aggregation, Southern California has about 300 thousand fewer employees, 30 thousand of which are from the agricultural production and processing sector, and total labor income becomes $632.5 billion.

In the six-county Southern California region, agricultural production and processing produced $12.5 billion in value added, or $36.8 billion considering ripple effects, in 2010. Total agricultural industry output was $42.2 billion. The forestry, fishing and hunting sector shrinks substantially when Imperial and Santa Barbara counties are excluded, moving from $268 million to $152 million in output. Agricultural support activities are also significantly smaller, with total sales of $891 million.

The six Southern California counties produced $6.2 billion in farming output in 2010. Employment on farms was about 30 thousand people, and 77 thousand jobs were generated in the economy as a whole because of farming. Direct effects of farming on labor income were $2.6 billion and total effects were $4.8 billion. Total value added, including ripple effects, was $7.2 billion. Within farming, the economic impacts of Southern California grains and oilseeds, vegetables, tree nuts, other crops, and especially beef cattle were appreciably smaller when excluding Imperial and Santa Barbara counties from the study.

Multiplier effects in the smaller Southern California aggregation were slightly different from the larger aggregation. All multipliers for agricultural production and processing were slightly higher when considering only the six counties. The employment multiplier becomes 3.00, labor income is 2.73 and value added is 2.95 (Table 4.2.2B). The value added multiplier for agricultural processing increases slightly to 3.28, while the other measures shrink. All multipliers for farming as a whole decrease, and beef cattle ripple effects fall dramatically. Multipliers for most other farming industries do not change much.

Table 4.2.2.A. Economic impact of Southern California's agricultural production and processing, 2010
Southern California: 6 Counties (excludes Imperial and Santa Barbara): Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	42,236	125,096	7,962	12,475	375,288	21,736	36,801
Agricultural processing[h]	34,989	70,610	4,628	8,480	270,436	16,059	27,814
Forestry, fishing, hunting	152	1,578	58	81	2,667	108	164
Ag support activities[i]	891	22,405	703	689	29,351	1,040	1,295
Farming	6,203	30,504	2,572	3,225	77,175	4,758	7,192
Grains & oilseeds	7	122	1	2	182	3	9
Cotton	15	59	2	3	190	7	13
Vegetables & melons	934	4,046	386	476	13,185	791	1,176
Fruit	2,054	10,979	921	1,092	33,681	1,906	2,697
Tree nuts	8	79	3	4	157	7	9
Greenhouse & nursery	1,879	9,136	1,130	1,245	25,263	1,926	2,602
Other crops	305	1,147	64	94	3,915	187	315
Beef cattle	91	519	5	15	922	25	52
Dairy cattle & milk	551	2,648	22	202	5,144	147	428
Poultry & eggs	272	301	27	50	1,593	96	170
Other animals	86	1,469	12	42	1,868	31	75
Total Southern California economy	1,705,380	11,135,571	632,522	1,050,424			

Source and notes: see Table 4.2.1. A.

Table 4.2.2.B. Economic impact of Southern California's agricultural production and processing, 2010

Southern California: 6 Counties (excludes Imperial and Santa Barbara): Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production & processing	3.00	2.73	2.95
Agricultural processing	3.83	3.47	3.28
Forestry, fishing, hunting	1.69	1.87	2.02
Ag-support activities	1.31	1.48	1.88
Farming	2.53	1.85	2.23
Grains& oilseeds	1.49	4.50	4.39
Cotton	3.24	3.56	4.46
Vegetables & melons	3.26	2.05	2.47
Fruit	3.07	2.07	2.47
Tree nuts	2.00	2.18	2.27
Greenhouse & nursery	2.77	1.70	2.09
Other crops	3.41	2.92	3.35
Beef cattle	1.78	4.96	3.46
Dairy cattle & milk	1.94	6.69	2.12
Poultry & eggs	5.29	3.54	3.40
Other animals	1.27	2.58	1.79

Source: see Table 4.2.1. A.

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

4.3 Tax Impacts of Southern California Agriculture

The IMPLAN model also allows us to measure the effects of industry changes on government tax receipts. State and local tax receipts include those from employee compensation (i.e. social insurance taxes), indirect business taxes (i.e. sales taxes), households (i.e. income and property taxes) and corporate taxes. Using IMPLAN, we estimate the tax consequences for Southern California agriculture given a decline in agricultural sales, including direct effects on agriculture and ripple effects on the economy, in Table 4.3.1. We find that if agricultural production and processing sales were to fall by 10 percent from 2010 levels, state and local tax revenues in Southern California would decrease by $378.0 million, $112.1 million of which would be taxes lost directly from agriculture. Similarly, a 10 percent decrease in farming output would lower total state and local tax revenue in the region by $87.6 million, including $28.9 million in losses from farming alone.

Naturally, the tax impacts of Southern California agriculture are smaller when comparing six counties rather than eight. If all agricultural industries in the six counties reduce output by 10 percent, total state and local tax revenue would decline by $348.9 million, with direct effects of $102.1 million. If only farming reduces output, tax revenues fall by a total of $59.6 million.

The tax impacts of agricultural industries differ significantly by region and allow us to compare the relative importance of farming and agricultural processing to government tax receipts. In less urban counties, such as Riverside, San Bernardino and Ventura, tax receipts generated from farming activities represent the bulk of receipts generated from agriculture as a whole. For example, in Imperial County, tax revenue lost from a decrease in farming output would account for three-quarters of the $13.4 million total tax loss from agriculture. On the other hand, in heavily urbanized counties such as Los Angeles, Orange and San Diego, agricultural processing comprises a far larger share of tax revenues than farming. In Los Angeles County, farming accounts for about 3 percent of the $126.5 million in tax revenue lost from a decrease in agricultural output, while the remainder ($123.2 million) comes from processing.

Table 4.3.1. State and local tax impacts[a] of a 10 percent decrease in 2010 Southern California agricultural output[b]

	Agricultural production (farming)		Agricultural production and processing	
	Direct effects	Total effects	Direct effects	Total effects
	($1,000)		($1,000)	
Imperial	-5,469	-10,182	-6,194	-13,444
Los Angeles	-1,190	-3,330	-50,228	-126,484
Orange	-1,163	-2,971	-7,799	-24,507
Riverside	-5,115	-11,404	-9,802	-19,691
San Bernardino	-1,641	-3,172	-5,682	-12,327
San Diego	-5,034	-12,680	-15,847	-32,621
Santa Barbara	-3,740	-8,954	-8,946	-16,567
Ventura	-5,584	-13,482	-6,781	-16,800
6-county total[c]	-19,628	-59,631	-102,105	-348,925
Southern California total	-28,861	-87,642	-112,137	-378,017

Source and notes: See Table 4.2.1A.

[a] State and local taxes include corporate taxes (profit taxes and dividends), personal taxes (income taxes, non-tax fines and fees, motor vehicle licensing fees, property taxes and other taxes), social insurance taxes (employee and employer contributions), and indirect business taxes (sales, property, severance and other taxes, motor vehicle licensing fees and other non-tax fees).

[b] Using IMPLAN, we calculate the total (direct, indirect and induced) effects of a 10 percent decrease in agricultural production (farming) sales alone and in agricultural production and processing sales as a whole on state and local tax receipts.

[c] The 6-county total excludes Imperial and Santa Barbara counties.

5. Commodity Case Studies

While the effects of agriculture in general are important, we also want to highlight the role of important individual commodity industries in the economy. This chapter considers four major crops and the dairy industry.

5.1 Strawberries

California strawberries are an important commodity both locally and abroad. Strawberries are the top commodity in Southern California with $951 million in 2010 production value (Table 5.1.1). They are also the number-one commodity for Santa Barbara and Ventura counties. Strawberries rank seventh among all California commodities with a total state production value of about $2 billion in 2010. In that year, about $378 million of California strawberries were internationally exported.[7]

Strawberry production in California has grown substantially in the last decade. Harvested acreage increased by 38 percent between 2000 and 2011 (Table 5.1.2). Strawberry yields per acre increased by 110 hundredweight over the same period. Both of these trends drove production 64 percent higher in eleven years. Price per hundredweight has fluctuated between $51 and $76.

To estimate the economic impact of the Southern California (eight counties) strawberry industry, we must expand our analysis to the regional fruit industry as a whole (Table 4.2.1A). In 2010, fruit was the largest farming industry with a production value of $2.5 billion. Strawberry production comprised about 38 percent of this value. IMPLAN estimates that the fruit industry generated over 40 thousand jobs in the regional economy, or three times the amount directly involved in fruit farming. The fruit labor income multiplier was 2.02, meaning that the industry created about the same number of jobs outside of fruit farming as inside (Table 4.2.1B). The fruit industry stimulated $3.2 billion in value added in the total economy, which is 2.42 times more than from fruit farming alone. We cannot assume that strawberry farming has the same magnitude of effects on the economy as the fruit industry as a whole, since multiplier effects are not additive. However, strawberries are a relatively labor-intensive and valuable fruit, so they do comprise a significant share of the total economic impact generated by Southern California fruit production.

[7] Source: University of California, Agricultural Issues Center (2012). 2010 California Agricultural Export Data. Accessed May 2012: http://aic.ucdavis.edu/

Table 5.1.1. Strawberry production in Southern California[a], 2010

	Total Value	Price	Production	Yield	Harvested Acreage
	$1,000	$/ton	tons	tons/acre	
Los Angeles	849	1,708	497	9.4	53
Orange	29,557	1,269	23,300	30.6	761
Riverside	10,220	2,505	4,080	12.5	327
San Bernardino	1,328	910	1,460	16.4	89
San Diego	11,463	1,497	7,657	33.9	226
Santa Barbara	355,203	1,310	271,200	35.3	7,680
Ventura	542,127	1,552	349,300	29.4	11,900
Southern California	950,747	1,446	657,494	31.3	21,036
California Total	2,067,187	1,590	1,299,767	34.3	37,895

Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

[a]Imperial County has no reported strawberry production.

Table 5.1.2. Strawberry production in California, 2000-2011

	Harvested Acres	Yield	Production	Value per unit	Total Value
		cwt per acre	cwt	$/cwt	$1,000
2000	27,600	570	15,732,000	51	800,334
2001	26,400	520	13,728,000	60	826,478
2002	28,500	565	16,097,000	58	931,649
2003	29,600	645	19,092,000	61	1,172,537
2004	33,200	590	19,588,000	53	1,040,900
2005	34,300	600	20,580,000	55	1,122,834
2006	35,800	590	21,163,000	57	1,199,341
2007	35,500	605	21,540,000	66	1,410,652
2008	37,600	605	22,675,000	70	1,578,175
2009	39,800	625	24,856,000	69	1,725,232
2010	38,600	670	25,829,000	70	1,769,574
2011	38,000	680	25,750,000	76	1,948,118

Sources: USDA, NASS (2012). Statistics by State, California Historical Data. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Historical_Data/index.asp

USDA, NASS (2012). California Fruit & Nut Review. March 20, 2012. Accessed June 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/Fruits_and_Nuts/201203frtrv.pdf

5.2 Woody Ornamentals

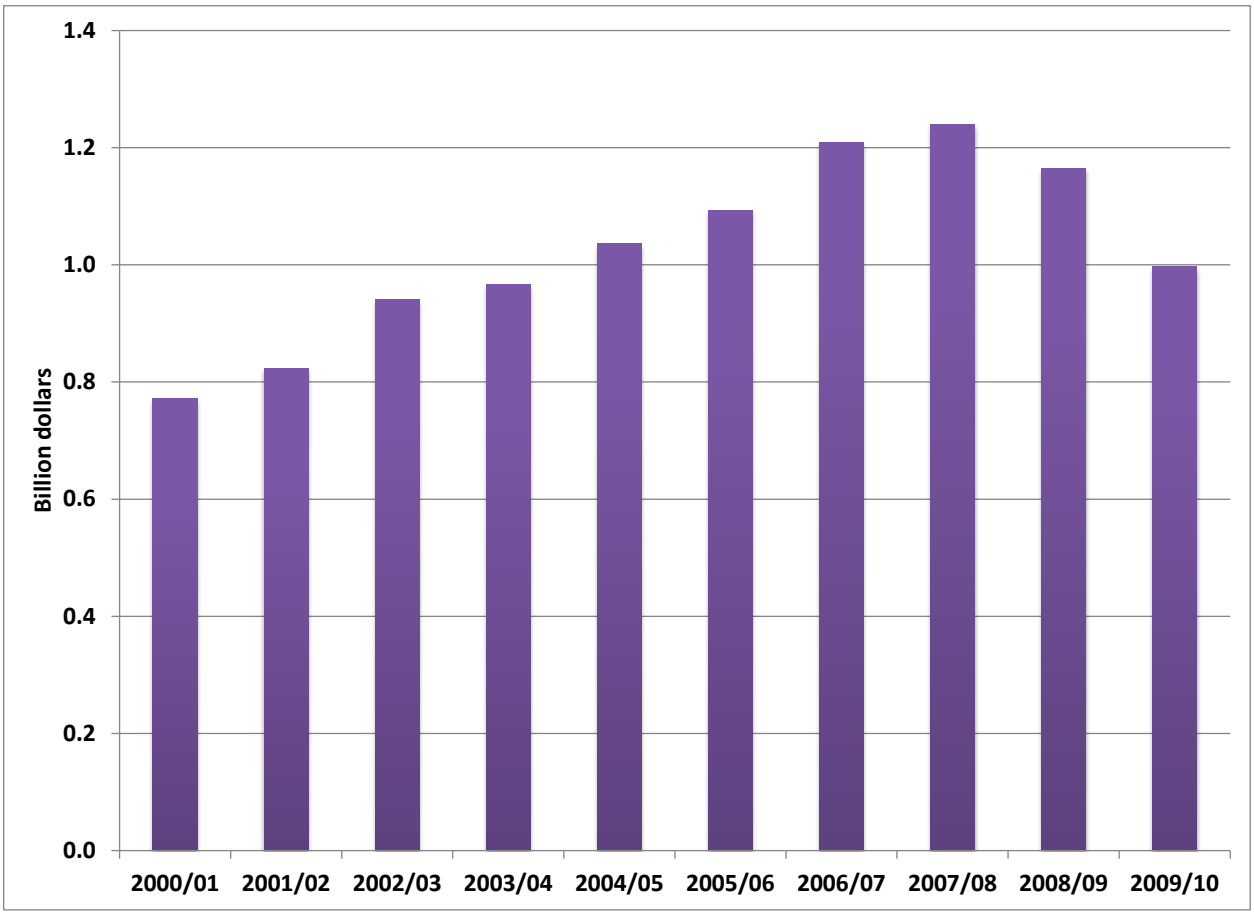
Woody ornamentals generally refer to decorative trees and shrubs grown in a nursery or greenhouse, including deciduous trees and shrubs, broadleaf and coniferous evergreens, and ornamental fruit trees. California wholesale value of these nursery products peaked in crop year 2007-08 at $1.2 billion (Figure 5.2.1). By 2009-10, wholesale value of woody ornamentals sank to about $996 million.

In Southern California, woody ornamentals were worth $772 million in 2010, making these plants the second most valuable commodity in the region (Table 5.2.1). Southern California produces over 80 percent of the state's woody ornamentals from 14,245 acres. San Diego County alone generates over half of Southern California production ($419 million). Riverside County produces another 17 percent.

Nursery production in the region has varied over time, as shown in Figures 5.2.2 and 5.2.3. Focusing only on woody ornamentals, we find that Southern California production increased from $0.6 billion to nearly $1 billion between 2000 and 2007, and then began a downward trend that brought production to just under $0.8 billion in 2010. In the meantime, San Diego County production value has continued to follow an upward trend, despite recent declines in other major counties such as Riverside and, particularly, Orange. This means that the share of woody ornamentals grown in San Diego County is increasing. At the same time, production of all nursery, flowers and floriculture in Southern California has increased in the last decade in San Diego, Santa Barbara, Ventura and Riverside counties, but has significantly fallen in Los Angeles and Orange counties. San Diego County is by far the dominant producer of these commodities, generating $1.1 billion in 2010 nursery, flowers and floriculture production.

The economic impacts of the greenhouse and nursery industry (including floriculture) in Southern California are considerable relative to other types of farming (Table 4.2.1A). The industry had sales of $2.1 billion in 2010, about 36 percent of which was woody ornamental sales, with $1.4 billion in value added. Accounting for multiplier effects, value added in the entire regional economy was about $3 billion. In comparison, value added from San Diego County greenhouse and nursery production was $832 million (Table 6.6.1A). While the industry creates about two other jobs for every one job within greenhouse and nursery, its labor income multiplier is the lowest of any farming industry at 1.69, indicating that labor income is relatively secluded within the sector (Table 4.2.1B).

Figure 5.2.1. California wholesale value of woody ornamental plants, 2000-2009



Source: Carman, Hoy. "Economic Aspects of the California Nursery and Floral Industry, 2001–2009." Giannini Foundation Information Series Report 11-1 (October 2011). Accessed May 2012: http://giannini.ucop.edu/InfoSeries/111-Nursery.pdf

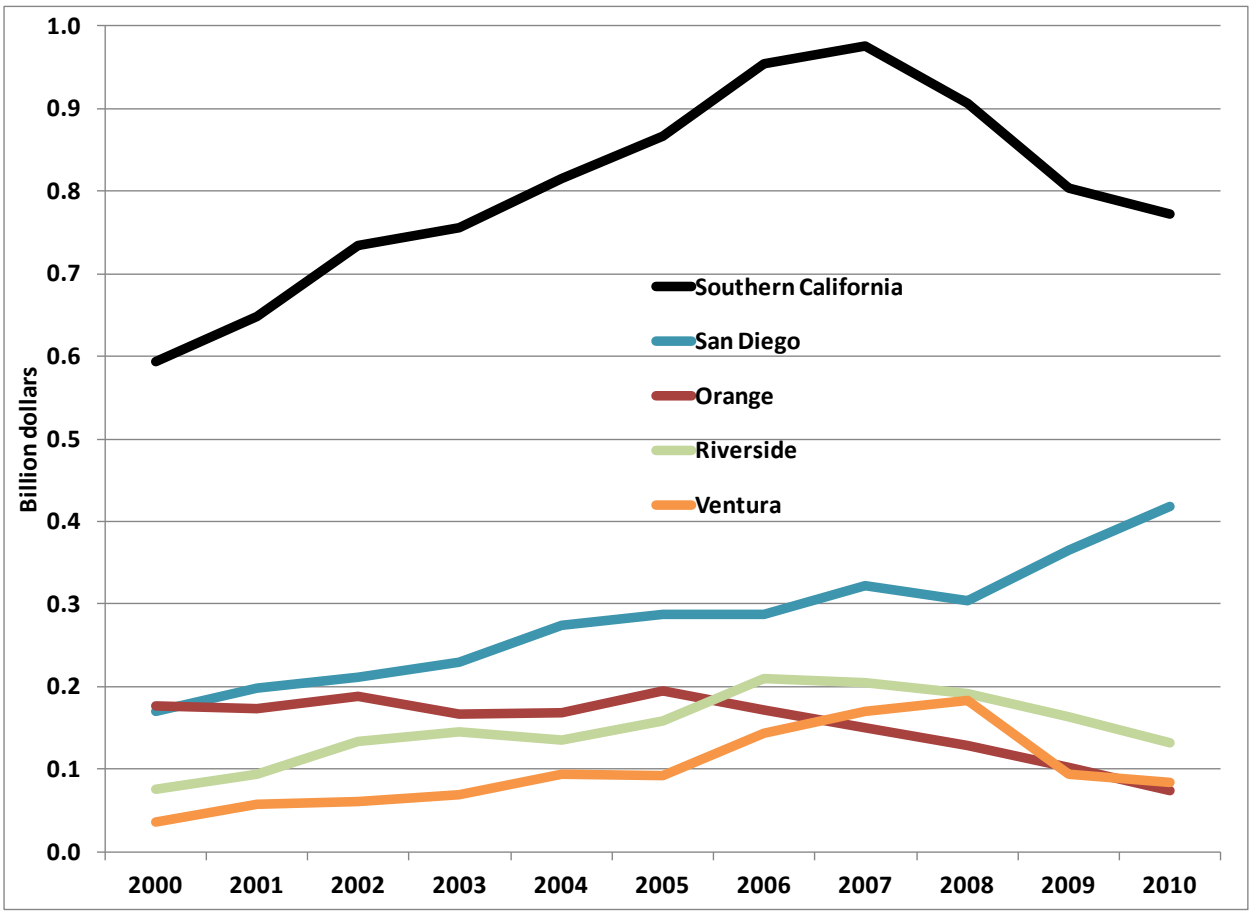
Table 5.2.1. Woody ornamental nursery production in Southern California, 2010

	Total Value	Harvested Acreage
	$1,000	
Los Angeles	51,282	1,180
Orange	73,747	N/A
Riverside	131,471	5,120
San Bernardino	11,496	562
San Diego	418,842	5,283
Ventura	84,670	2,100
Southern California	771,508	14,245
California Total	956,878	15,723

Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

[a]Imperial and Santa Barbara counties have no reported woody ornamental production.

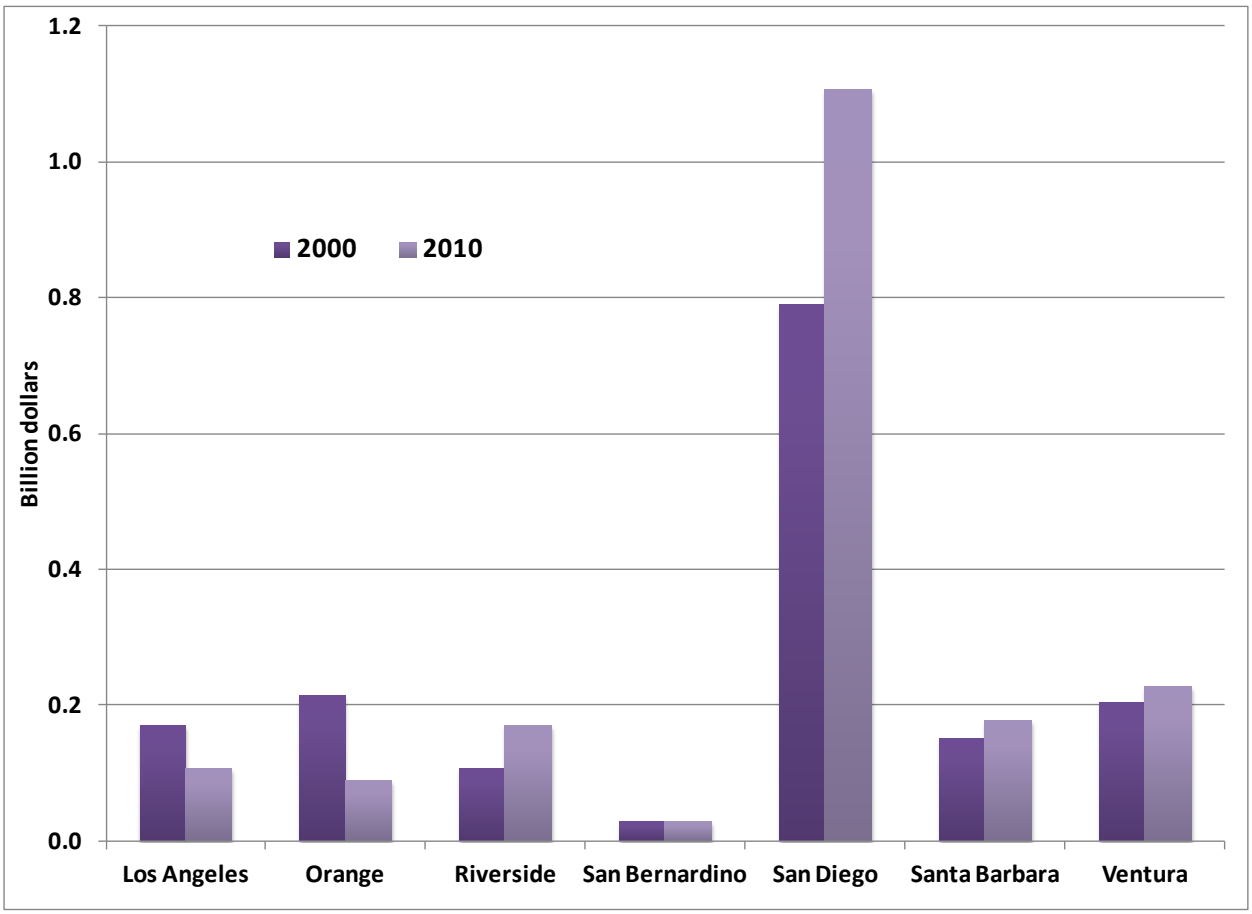
Figure 5.2.2. Value of woody ornamental production in Southern California and selected counties[a], 2000-2010



Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, various. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

[a]Imperial and Santa Barbara counties have no reported woody ornamental production. Los Angeles and San Bernardino counties, not shown, together make up 8 percent of 2010 Southern California woody ornamental production value.

Figure 5.2.3. Value of nursery, flowers and floriculture production in Southern California and selected counties[a], 2000-2010



Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, various. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

[a]Imperial County not shown, as it represents less than 1 percent of Southern California production value for nursery, flowers and floriculture.

5.3 Lettuce

At $456 million, lettuce is the third most valuable commodity produced in Southern California (Table 5.3.1). Head and leaf lettuce each make up about 45 percent of this value, while the rest is romaine. Imperial County produces the majority of Southern California lettuce, or 66 percent of total value, and Santa Barbara County produces 22 percent. These counties have substantially higher yields per acre than the rest of the region.

Total California lettuce production and acreage were highest in the mid-2000s (Table 5.3.2). In 2011, production was at its lowest in ten years, in part due to exceptionally low yields of 315 hundredweight per acre. Except for a price spike in 2009, lettuce prices have stayed relatively constant for the past five years.

The steady but substantial Southern California lettuce market produces about one-quarter of total vegetable and melon output in the region (Table 4.2.1A). The vegetable industry has a relatively high employment multiplier of 3.54, meaning that the roughly 7 thousand jobs within the industry generate about 17 thousand jobs outside of it (Table 4.2.1B). Vegetable and melon farming has smaller direct effects than fruit farming in terms of labor income and value added, but the multiplier effects are the same.

Table 5.3.1. Lettuce[a] production in Southern California[b], 2010

	Total Value	Price	Production	Yield	Harvested Acreage
	$1000	$/ton	tons	tons/acre	
Imperial	301,312	518	581,600	17	33,800
Riverside	36,593	623	58,700	13	4,690
San Diego	2,511	411	6,100	11	575
Santa Barbara	101,346	464	218,400	16	14,070
Ventura	13,988	584	23,970	12	2,082
Southern California	455,750	513	888,770	16	55,217
California Total	2,067,248	476	4,340,617	18	239,204

Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

[a]Lettuce includes head, leaf and romaine.

[b]Los Angeles, Orange and San Bernardino counties have no reported lettuce production.

Table 5.3.2. California production of all lettuce[a], 2000-2011

	Harvested acres	Yield	Production	Value per unit	Total value
		cwt/acre	cwt	$/cwt	$1000
2000	208,000	345	71,830,000	20.5	1,473,871
2001	211,000	327	69,020,000	19.2	1,326,494
2002	221,000	338	74,615,000	17.7	1,318,281
2003	239,000	327	78,170,000	24.5	1,914,666
2004	239,000	336	80,405,000	18.1	1,456,108
2005	212,000	345	73,140,000	18.3	1,339,383
2006	244,000	319	77,900,000	22.1	1,724,158
2007	228,000	324	73,815,000	23.0	169,7278
2008	219,500	317	69,495,000	22.75	1,580,831
2009	203,500	325	66,065,000	26.39	1,743,573
2010	202,500	350	70,880,000	22.7	1,605,283
2011	206,200	315	64,948,000	23.3	1,513,023

Source: USDA, NASS (2012). Statistics by State, California Historical Data. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Historical_Data/index.asp

[a]Lettuce includes head, leaf and romaine.

5.4 Dairy

Dairy products generate more sales value in the state of California than any other commodity. Southern California cows produced 7.2 percent of the state's milk in 2011 (Table 5.4.1). Based on data from the California Department of Food and Agriculture (CDFA), we estimate that these 30 million hundredweight of milk, 1 percent of which was destined for manufacturing, generated $552 million in production value. About 55 percent of Southern California milk comes from San Bernardino County, and most of the remainder originates in Riverside County.

Across the state, both the number of milk cows and total milk production increased every year from 2000 to 2008, but decreased somewhat in 2009 and continued to fluctuate through 2011 (Table 5.4.2). Milk production per cow varies annually, but has generally shown an increasing trend. Production value has also fluctuated in response to increasing price volatility. Using California Department of Food and Agriculture data, we estimate that the value of California milk production was $7.7 billion in 2011. The price of California market milk (not including manufacturing milk) generally stayed within the range of $11 to $15 per hundredweight from 1991 to 2006 and from 2009 to 2010 (Figure 5.4.1). However, in 2007 and 2011, the average annual market milk price shot up to $18.01 and $18.52, respectively, translating to record profits for dairy farmers.

In light of the recent variability in the dairy market, it is important to consider how this market impacts the economy in general in order to brace for unexpected fluctuations. Total output of Southern California dairy cattle and milk production was worth $592 million in 2010 (Table 4.2.1A), about $11 million of which was from the San Bernardino County replacement heifer industry.[8] Value added by the dairy industry was about $217 million, with relatively small ripple effects on the rest of the economy. Notably, the labor income multiplier for the dairy industry was the highest of any agricultural industry at 6.57 (Table 4.2.1B). This means that $1 of labor income in dairy creates $5.57 in other industries. Two main factors contributed to this unusual result. First, the dairy industry has a higher portion of purchased inputs (feed, animals) relative to direct labor income and value added than in other agricultural industries.

[8] Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

Second, the direct effect estimates were biased down for California because the IMPLAN database uses national parameters that reflect a large share of activity from very small, part time farms contributing little or no value added. This makes estimations of total (direct, indirect and induced) effects seem higher in comparison to the direct effect estimations, and thus the multipliers are higher.[9]

Table 5.4.1. Southern California[a] milk[b] production by county, 2011

	Production	Total Value[c]
	1,000 cwt	$ 1,000
Imperial	1,585	29,365
Riverside	10,176	188,497
San Bernardino	16,522	306,060
San Diego	516	9,588
Southern California	29,796	551,939
California Total	414,279	7,674,107

Source: California Department of Food and Agriculture (2012). California Dairy Statistics Annual 2011. Accessed June 2012: http://www.cdfa.ca.gov/dairy/dairystats_annual.html

[a]Orange and Ventura counties have no reported milk production. CDFA does not publish Los Angeles, San Luis Obispo, and Santa Barbara county milk production data, but includes it in the Southern California and state totals.

[b]Includes market and manufacturing milk.

[c]Total value calculated using the California average producer price received for all milk in 2011 ($18.52 per cwt), also from the above source.

[9] From the UC Agricultural Issues Center's *The Measure of California Agriculture 2012*, which is yet unpublished as of May, 2012. Previous versions are available at aic.ucdavis.edu.

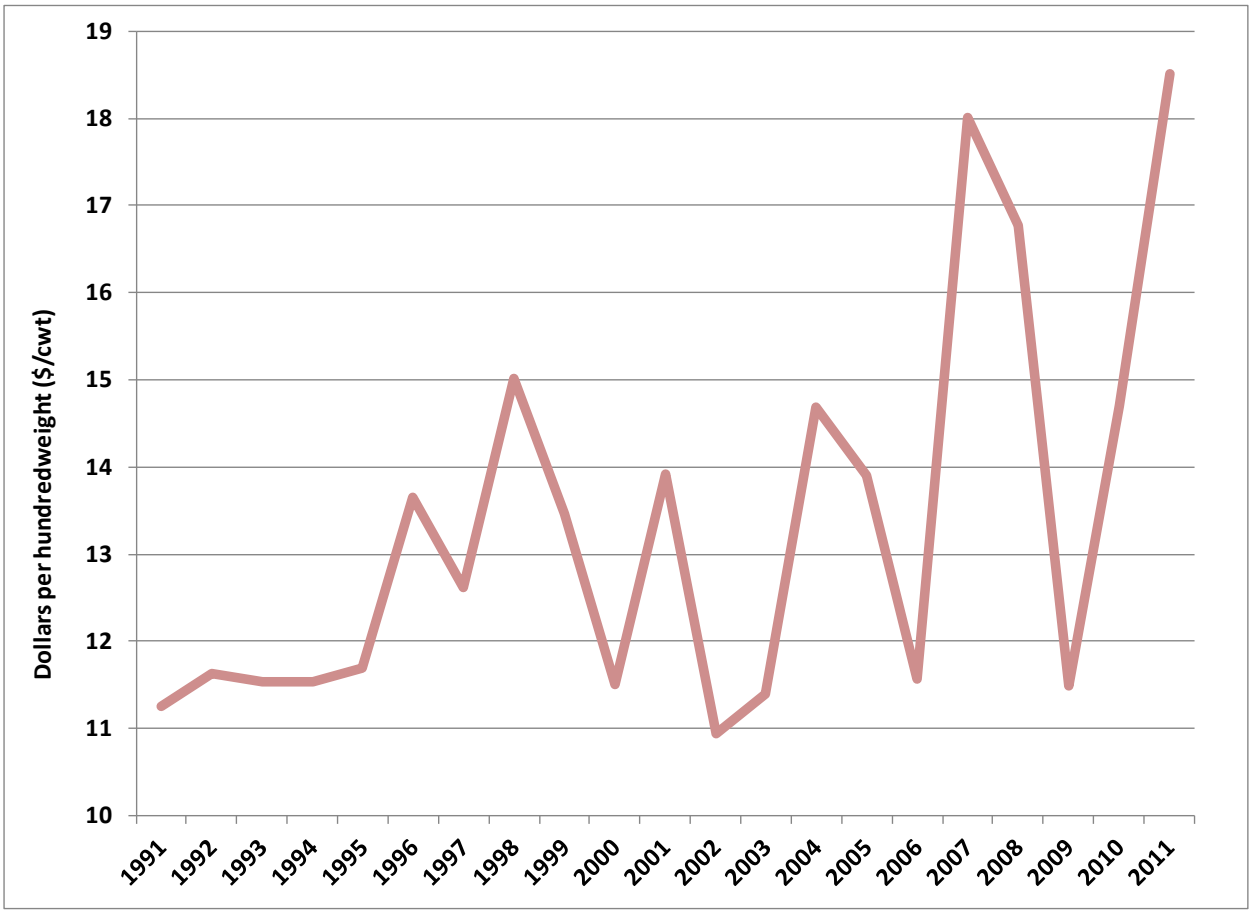
Table 5.4.2. Profile of California milk cows and all milk production, 2000-2011

	Number of Milk Cows (Annual Avg.)	Production Per Milk Cow	Milk Production on Farms	Value Per Unit	Total Value
	1,000 Head	Pounds	Million Lbs.	$/Cwt.	$1,000
2000	1,526	21,130	32,245	11.50	3,704,035
2001	1,589	20,904	33,217	13.94	4,625,431
2002	1,648	21,277	35,065	10.94	3,832,501
2003	1,688	20,993	35,437	11.38	4,032,731
2004	1,725	21,139	36,465	14.73	5,371,295
2005	1,755	21,404	37,564	13.92	5,228,909
2006	1,780	21,815	38,830	11.58	4,496,514
2007	1,813	22,440	40,683	18.05	7,343,282
2008	1,844	22,344	41,203	16.82	6,930,345
2009	1,796	22,000	39,512	11.49	4,539,929
2010	1,858	21,720	40,355	14.70	5,932,837
2011	1,836	22,564	41,428	18.52	7,674,107

Sources: USDA, NASS (2012). Statistics by State, California Historical Data. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Historical_Data/index.asp

California Department of Food and Agriculture (2012). California Dairy Statistics Annual 2011. Accessed June 2012: http://www.cdfa.ca.gov/dairy/dairystats_annual.html

Figure 5.4.1. Average annual prices of California market milk, 1991-2011



Sources: University of Wisconsin, Dairy Marketing and Risk Management Program (2012). Milk Prices, Fluid Grade Milk Price. Accessed May 2012: http://future.aae.wisc.edu/tab/prices.html#19

California Department of Food and Agriculture (2012). Dairy Information Bulletin (May 2012). Accessed May 2012: http://www.cdfa.ca.gov/dairy/uploader/postings/infobulletin/Default.aspx

5.5 Avocados

As of 2010, avocados are the fifth most valuable commodity in Southern California, where most of the state's production occurs.[10] Throughout the state, production has shown no evident trend over the past decade. Crop years 2005-06 and 2009-10 were especially productive, with yields of nearly 5 tons per acre and total production of over 270,000 tons (Table 5.5.1). At $3,040 per ton, California avocado prices were highest during the 2010-11 crop year. Harvested acreage peaked in 2007-08 at 66,000 acres.

Over the past two decades, there has been plenty of annual variation in the real value of avocado production, but little overall trend. State production value has ranged from $437 million in 2004 to $236 million in 1993 (Figure 5.5.1). San Diego County has dominated avocado production for most of the past decade, producing a high of $251 million (in real dollars), or almost two-thirds of the state's output, in 2005. Santa Barbara and Riverside counties fluctuated between $15 and $80 million in real avocado production value from 1990 to 2010. The County Agricultural Commissioners reported no avocado production for Orange County from 2006 to 2010 due to confidentiality issues.[11] Ventura County is a highly significant location for avocado farming, and due to higher yields, it produced slightly more than San Diego County in 2010 (Table 5.5.2).

As a significant part of the Southern California fruit industry, avocados have an important role in regional economy and employment. Avocado sales comprised about 15 percent of total fruit output in 2010 (Table 4.2.1A). As in the case of strawberries, this makes avocados a notable contributor to the 40 thousand jobs, $2.3 billion in labor income and $3.2 billion in value added generated by the fruit industry in the total Southern California economy.

[10] Based on data from the County Agricultural Commissioners' Report 2011. No other by-county sources for production data are publicly available. The Census of Agriculture does not have county-specific production data for most individual crops, but does report acreage by county for some crops. The 2007 Census estimates 69,066 acres of avocados in the Southern California counties.

[11] The Orange County Agricultural Commissioner does not publish data for an individual crop when a single grower comprises 60 percent or more of county production, as is the case with avocados. Orange County submits detailed avocado crop information to NASS, which is likely included in the "Sum of Other Counties" total in the County Agricultural Commissioners' Detailed Report 2011. The California Avocado Commission reports 1,224 acres of avocado production in Orange County in 2012, and the Census of Agriculture estimated 1,187 acres in 2007.
Sources: USDA, NASS. Census of Agriculture 2007. Accessed May 2012:
http://www.agcensus.usda.gov/Publications/2007/Full_Report/
Office of the Orange County Agricultural Commissioner. Personal communication (June 13, 2012).
Peterson, Gwen. California Avocado Commission. Personal communication (June 13, 2012).

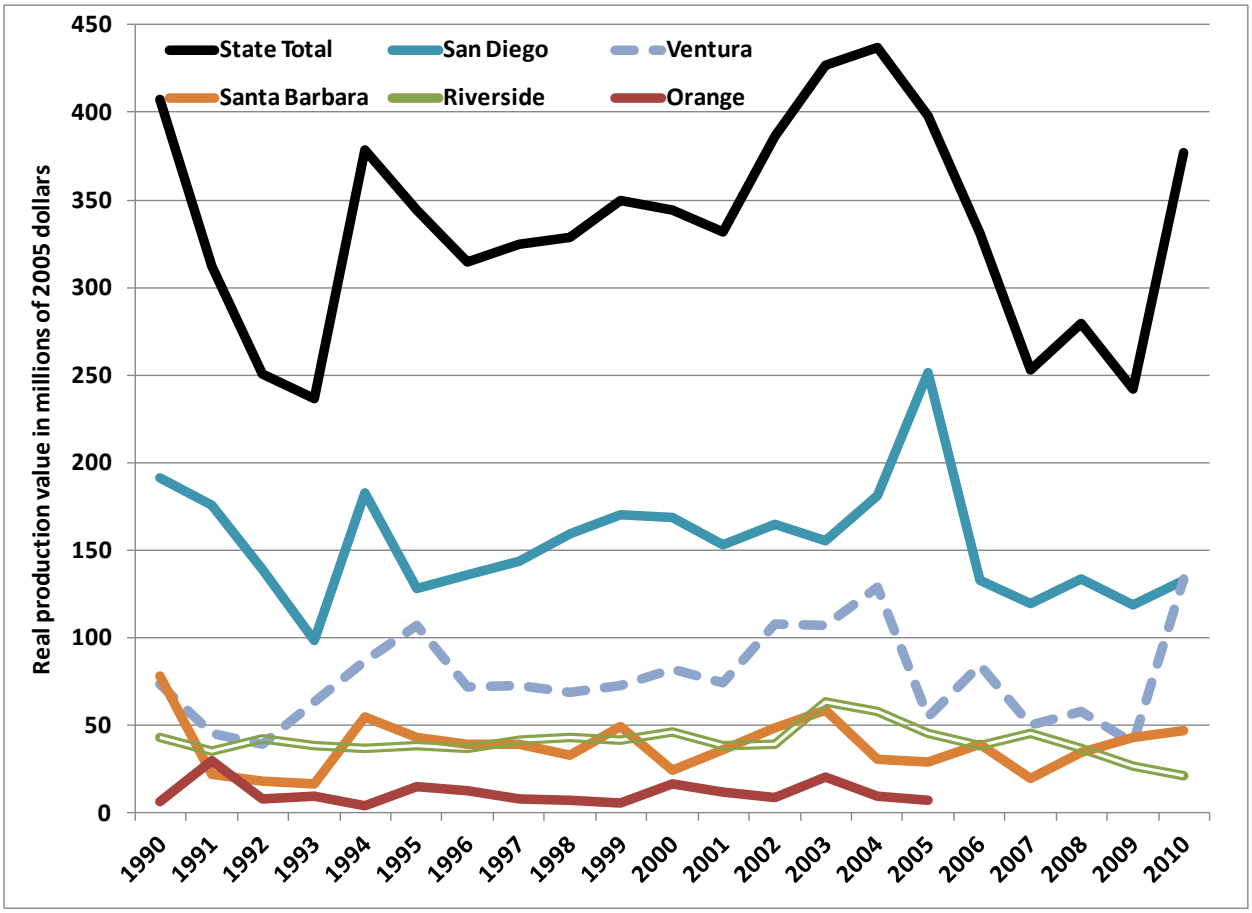
Table 5.5.1. Avocado production in California, 2000-2011

Crop year	Bearing land	Yield	Production	Value per Unit	Total Value
	acres	tons per acre	tons	dollars per ton	$1,000
2000-01	59,000	3.61	213,000	1,480	315,842
2001-02	58,500	3.42	200,000	1,790	358,000
2002-03	59,500	2.82	168,000	2,170	364,560
2003-04	60,500	3.57	216,000	1,760	380,160
2004-05	62,000	2.44	151,000	1,830	276,330
2005-06	62,100	4.83	300,000	1,140	342,000
2006-07	65,000	2.03	132,000	1,890	249,480
2007-08	66,000	2.50	165,000	1,990	328,350
2008-09	65,000	1.35	88,000	2,280	200,640
2009-10	58,500	4.70	274,800	1,510	414,948
2010-11	52,200	2.90	151,500	3,040	460,560

Source: USDA, NASS (2012). Statistics by State, California Historical Data. Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Historical_Data/index.asp

USDA, NASS (2012). California Fruit & Nut Review. March 20, 2012. Accessed June 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/Fruits_and_Nuts/201203frtrv.pdf

Figure 5.5.1. Real (2005) value of avocado production, California and southern counties[a], 1990-2010



Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

Bureau of Economic Analysis GDP price deflator, year 2005=100. http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=13&ViewSeries=NO&Java=no&Request3Place=N&3Place=N&FromView=YES&Freq=Qtr&FirstYear=1986&LastYear=2010&3Place=N&Update=Update&JavaBox=no#Mid

[a]Imperial County and Orange County (after 2005) have no reported avocado production.

Table 5.5.2. Avocado production in Southern California[a], 2010

	Total Value $1,000	**Price** $/ton	**Production** tons	**Yield** tons/acre	**Harvested Acreage**
Los Angeles	185	693	267	3.1	87
Riverside	23,551	1,354	17,400	2.8	6,170
San Bernardino	1,448	1,583	915	4.3	213
San Diego	147,052	1,804	81,500	4.3	19,100
Santa Barbara	52,063	1,820	28,600	3.8	7,430
Ventura	148,343	1,628	91,100	4.8	18,900
Southern California	**372,457**	**1,697**	**219,515**	**4.2**	**51,813**
California Total	**418,342**	**1,686**	**248,171**	**4.3**	**57,747**

Source: USDA, NASS, California Field Office (2011). California County Agricultural Commissioners' Data, 2010 Crop Year (2011). Accessed May 2012: http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Detail/index.asp

[a]Imperial and Orange counties have no reported avocado production.

6. County Case Studies

In this chapter, we consider in more detail the role of agriculture in the individual counties that comprise the Southern California regions. These counties differ strongly in the size of agriculture and its share of the economy in each county. Imperial is the most agricultural county, whereas there is very little agriculture left in the coastal and urban counties of Los Angeles and Orange.

6.1 Imperial

As we have seen, agriculture is a very important part of the Imperial County economy, accounting for about 15 percent of the county's gross domestic product from 2000 to 2009 (Table 3.1.1). Imperial County agriculture was the third largest of all Southern California counties. Imperial produced 72 percent of the region's field and seed crops, 35 percent of its vegetable and melon crops and 31 percent of its livestock and related products in 2010 (Table 3.4.3).

IMPLAN results reinforce our finding that Imperial County is one of the top three Southern California counties in agriculture. While output from all industries in Imperial represented less than one percent of the total Southern California economy, the county's agricultural industries made up 6.4 percent of regional agricultural production and processing output (Tables 6.1.1A and 4.2.1A). (Imperial also comprised 35 percent of Southern California forestry, fishing and hunting output and 17 percent of agricultural support sales.)

Within farming, Imperial County was dominated by a few commodities not significantly produced in other Southern California counties. Unspecified crops made up the bulk of Imperial direct sales and economy-wide employment from farming (Table 6.1.1A). Vegetable and melon farming yielded the highest direct labor income and value added, but value added including ripple effects was greater for unspecified crops. Imperial County sold 84 percent of Southern California grains and oilseeds and 30 percent of cotton in 2010, though in terms of total economic and employment effects these were relatively small industries in the county. Imperial was the main producer of beef cattle in Southern California, selling nearly 80 percent of all cattle in the region. The beef cattle industry had a relatively high number of employees compared to other farming industries, though labor income was low within the industry.

Multiplier effects of the agricultural industries in Imperial County were significantly lower than in the region as a whole (Table 6.1.1B). This is especially true for the industries in which Imperial is the main producer, such as grains and oilseeds, cotton, vegetables and beef cattle. This indicates that although agriculture is a high share of GDP in Imperial, the rest of the county economy is actually relatively independent of agriculture.

Table 6.1.1.A. Economic impact of Imperial County's agricultural production and processing, 2010

Imperial County: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	3,041	14,426	660	907	22,937	990	1,533
Agricultural processing[h]	994	1,978	87	118	4,077	171	285
Forestry, fishing, hunting	94	1,493	15	24	1,755	23	38
Ag support activities[i]	250	7,425	187	182	8,267	213	239
Farming	1,704	3,531	371	582	9,280	580	994
Grains & oilseeds	61	376	6	12	549	11	24
Cotton	6	10	0.9	1	29	1	2
Vegetables & melons	431	496	159	220	2,089	208	318
Fruit	100	152	41	53	574	54	76
Tree nuts	0	0	0	0	0	0	0
Greenhouse & nursery	10	15	6	7	48	7	9
Other crops	633	1,280	132	199	3,409	199	339
Beef cattle	409	1,016	21	68	2,328	66	173
Dairy cattle & milk	31	71	1	11	122	3	15
Poultry & eggs	1	1	0.1	0.3	3	0.2	0.4
Other animals	22	115	3	11	161	4	14
Total Imperial County economy	9,247	71,794	3,364	5,321			

Source and notes: see Table 4.2.1. A

Table 6.1.1.B. Economic impact of Imperial County's agricultural production and processing, 2010

Imperial County: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production & processing	1.59	1.50	1.69
Agricultural processing	2.06	1.96	2.42
Forestry, fishing, hunting	1.18	1.57	1.55
Ag-support activities	1.11	1.14	1.31
Farming	2.63	1.56	1.71
Grains & oilseeds	1.46	1.85	1.97
Cotton	2.88	1.62	2.01
Vegetables & melons	4.21	1.30	1.45
Fruit	3.77	1.30	1.44
Tree nuts	0.00	0.00	0.00
Greenhouse & nursery	3.30	1.17	1.31
Other crops	2.66	1.50	1.70
Beef cattle	2.29	3.08	2.54
Dairy cattle & milk	1.71	2.54	1.36
Poultry and eggs	5.46	1.71	1.62
Other animals	1.40	1.59	1.32

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

6.2 Los Angeles

Because Los Angeles is a largely urban county, farming is a relatively insignificant part of the overall economy. The $439 million in output from farming alone comprised less than 1 percent of Los Angeles County total industry output and about 5 percent of farming output across Southern California in 2010 (Tables 4.2.1A and 6.2.1A). The greenhouse and nursery industry was responsible for more than half of the direct, indirect and induced effects of Los Angeles farming.

On the other hand, at 60 percent of regional output, the agricultural processing industry in Los Angeles County is far larger than in any other Southern California county, making Los Angeles the top county in total agricultural industry output. About 97 percent, or $22 billion, of Los Angeles agricultural industry output was concentrated in processing. The 45 thousand jobs within Los Angeles processing created a total of 126 thousand jobs in the total economy. Value added in the industry was $5.4 billion and labor income was $3 billion. Accounting for ripple effects, these impacts increase to $13.1 billion and $7.5 billion, respectively.

However, note that despite the significant direct impact of the Los Angeles County agricultural processing industry, multiplier effects in this industry were smaller than in the Southern California region overall (Table 6.2.1B). In general, all Los Angeles agricultural multipliers were smaller than the regional multipliers, particularly for employment. This indicates that the total Los Angeles labor market is not notably affected by agricultural industries.

Table 6.2.1.A. Economic impact of Los Angeles County's agricultural production and processing, 2010

Los Angeles County: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	22,605	51,633	3,330	5,775	143,788	8,434	14,877
Agricultural processing[h]	21,991	45,347	2,999	5,428	125,555	7,525	13,122
Forestry, fishing, hunting	89	1,167	33	44	1,615	55	81
Ag support activities[i]	87	2,015	70	69	2,586	98	119
Farming	439	3,103	228	235	5,695	353	470
Grains & oilseeds	0.7	23	0.1	0.1	26	0.2	0.4
Cotton	0	0	0	0	0	0	0
Vegetables & melons	92	555	40	47	1,136	67	98
Fruit	24	188	12	13	348	20	27
Tree nuts	0.2	3	0.1	0.1	4	0.1	0.2
Greenhouse & nursery	227	1,670	161	150	3,191	235	282
Other crops	17	132	4	5	231	8	14
Beef cattle	3	41	0.3	0.5	50	0.8	1
Dairy cattle & milk	14	175	1	5	217	3	9
Poultry & eggs	53	97	7	10	276	17	28
Other animals	8	219	2	4	246	4	7
Total Los Angeles County economy	864,202	5,420,969	315,506	526,839			

Source and notes: see Table 4.2.1. A

Table 6.2.1.B. Economic impact of Los Angeles County's agricultural production and processing, 2010

Los Angeles County: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production & processing	2.78	2.53	2.58
Agricultural processing	2.77	2.51	2.42
Forestry, fishing, hunting	1.38	1.67	1.84
Ag-support activities	1.28	1.40	1.72
Farming	1.84	1.55	2.00
Grains & oilseeds	1.16	3.02	3.61
Cotton	0.00	0.00	0.00
Vegetables and melons	2.05	1.68	2.09
Fruit	1.85	1.66	2.06
Tree nuts	1.33	1.61	2.01
Greenhouse & nursery	1.91	1.46	1.88
Other crops	1.75	2.09	2.83
Beef cattle	1.23	2.54	2.85
Dairy cattle & milk	1.24	3.08	1.79
Poultry & eggs	2.84	2.39	2.75
Other animals	1.12	1.83	1.64

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

6.3 Orange

Like Los Angeles County, Orange County is becoming increasingly urban, and contains less than 8 thousand acres of cropland (Table 3.3.1). Agriculture production and processing sales made up about 1.5 percent of county output in 2010 (Table 6.3.1A). Orange County farming comprised 4 percent, or $378 million, of Southern California farming output, making Orange the smallest farming county in the region. Farming accounted for 0.1 percent of value added (an approximation of GDP) in the county. Most of this farming was of horticultural crops, especially greenhouse and nursery products, which generated about three-quarters of county farming value and employment. Orange County does not participate in the grain, oilseed, cotton or dairy markets.

Also similar to Los Angeles, Orange County agricultural processing is far more important to the local economy than farming. The processing industry produced about $4 billion in sales value in 2010, which was 90 percent of the value produced by all agricultural industries. Agricultural processing employed about three-quarters of agricultural employees in Orange, translating to nearly 20 thousand jobs in all industries when including ripple effects. The total effects of processing labor income amounted to $1.3 billion, and economy-wide value added from the industry was over $2 billion.

Unlike previously discussed counties, Orange County employment multipliers for horticultural farming tended to be higher than regional multipliers. For example, the fruit and vegetable multipliers for Orange were 3.55 and 3.91, respectively, versus 3.00 and 3.54 in Southern California as a whole (Table 6.3.1B). This suggests that jobs in Orange County horticulture enhance the total county job market more than they do in other counties. Multipliers for other county agricultural industries were generally smaller than those for the broader region. Employment and value added multiplier effects for unspecified animal production were lowest out of all agricultural industries in Orange.

Table 6.3.1.A. Economic impact of Orange County's agricultural production and processing, 2010

Orange County: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	4,445	10,910	790	1,212	25,813	1,637	2,709
Agricultural processing[h]	3,999	7,975	558	928	19,813	1,250	2,091
Forestry, fishing, hunting	6	65	2	3	99	3	6
Ag support activities[i]	63	1,713	48	47	2,091	67	81
Farming	378	1,157	181	234	3,293	281	414
Grains & oilseeds	0	0	0	0	0	0	0
Cotton	0	0	0	0	0	0	0
Vegetables & melons	35	86	12	18	337	23	37
Fruit	43	142	17	23	503	32	48
Tree nuts	0	3	0	0	6	0	0
Greenhouse & nursery	287	867	150	190	2,531	230	330
Other crops	0	1	0	0	3	0	0
Beef cattle	2	13	0	0	19	0	1
Dairy cattle & milk	0	0	0	0	0	0	0
Poultry & eggs	6	5	1	1	20	1	2
Other animals	4	40	0	2	50	1	3
Total Orange County economy	299,758	1,870,049	112,541	185,054			

Source and notes: see Table 4.2.1. A

Table 6.3.1.B. Economic impact of Orange County's agricultural production and processing, 2010

Orange County: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production and processing	2.37	2.07	2.24
Agricultural processing	2.48	2.24	2.25
Forestry, fishing, hunting	1.53	1.65	1.92
Ag-support activities	1.22	1.40	1.73
Farming	2.85	1.55	1.77
Grains and oilseeds	0.00	0.00	0.00
Cotton	0.00	0.00	0.00
Vegetables and melons	3.91	1.88	2.06
Fruit	3.55	1.89	2.07
Tree nuts	1.91	2.05	1.90
Greenhouse & nursery	2.92	1.54	1.74
Other crops	3.16	2.54	2.80
Beef cattle	1.48	3.89	2.54
Dairy cattle and milk	0.00	0.00	0.00
Poultry and eggs	4.10	2.58	2.14
Other animals	1.25	2.32	1.49

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

6.4 Riverside

Stretching from east to west in a narrow strip across Southern California, Riverside County is a relatively diverse agricultural producer. Agricultural industries made up about 3.7 percent of total county output in 2010 (Table 6.4.1A). About 49 percent of agricultural production and processing output was from processing alone, while 44 percent, or $1.6 billion, was from farming. Riverside was among the top three Southern California counties in sales of field and seed crops, fruit, and livestock and products. The Riverside agricultural industry was backed by 7 thousand employees involved in support activities, which represents more jobs than in farming alone. However, the ripple effects of farming created more jobs overall (a total of 14,798) than did support activities.

While nearly 40 percent of Riverside farming value arose from fruit production alone, vegetable farming, greenhouse and nursery production, other crop farming and dairy each contributed 10 to 15 percent of total output. Including total effects, value added from fruit farming amounted to $604 million. Riverside is one of only three significant milk-producing counties in Southern California, generating $96 million in economy-wide value added from this industry. Riverside County also produced three-quarters of Southern California cotton in 2010, yielding a total of $9 million of value added throughout the economy.

Like Imperial County, Riverside multipliers for agricultural production and processing were less than 2 (Table 6.4.1B). Agriculture makes up a relatively large percentage of Riverside industry output, yet low multipliers across the board indicate that agricultural industries have little impact within the county economy. Because IMPLAN does not estimate economic effects outside of the designated region, we do not know if Riverside County agriculture has greater impacts elsewhere.

Table 6.4.1.A. Economic impact of Riverside County's agricultural production and processing, 2010

Riverside County: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	3,654	16,372	920	1,340	28,878	1,402	2,289
Agricultural processing[h]	1,778	3,374	204	384	8,624	407	776
Forestry, fishing, hunting	29	131	9	17	260	13	25
Ag support activities[i]	252	7,058	193	189	8,431	241	285
Farming	1,594	5,808	514	750	14,798	820	1,344
Grains & oilseeds	5	73	1	1	105	1	3
Cotton	15	59	2	3	163	5	9
Vegetables & melons	247	658	90	126	2,439	148	233
Fruit	618	2,183	251	329	7,340	417	604
Tree nuts	2	18	1	1	32	1	2
Greenhouse & nursery	203	661	110	135	1,796	149	209
Other crops	211	741	44	65	2,205	92	155
Beef cattle	29	168	1	5	272	4	13
Dairy cattle & milk	166	895	6	61	1,393	23	96
Poultry & eggs	74	61	6	14	234	12	26
Other animals	24	292	3	12	369	6	17
Total Riverside County economy	98,818	789,516	34,006	59,504			

Source and notes: see Table 4.2.1. A

Table 6.4.1.B. Economic impact of Riverside County's agricultural production and processing, 2010

Riverside County: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production & processing	1.76	1.52	1.71
Agricultural processing	2.56	1.99	2.02
Forestry, fishing, hunting	1.99	1.50	1.44
Ag-support activities	1.19	1.25	1.51
Farming	2.55	1.59	1.79
Grains & oilseeds	1.44	2.96	3.12
Cotton	2.79	2.48	3.16
Vegetables & melons	3.71	1.64	1.85
Fruit	3.36	1.66	1.84
Tree nuts	1.84	1.75	1.70
Greenhouse & nursery	2.72	1.35	1.55
Other crops	2.98	2.08	2.39
Beef cattle	1.62	3.57	2.60
Dairy cattle & milk	1.56	3.82	1.57
Poultry & eggs	3.87	2.08	1.87
Other animals	1.26	1.99	1.43

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

6.5 San Bernardino

San Bernardino County is the leading producer of livestock and livestock products in the Southern California region, with about $474 million in production value in 2010 (Table 6.5.1A). Less than 10 percent of San Bernardino's extensive farmland is cropland, which makes it ideal for livestock production (Table 3.3.1). San Bernardino was responsible for 61 percent, or $241 million, of Southern California milk production value in 2010 (Table 5.4.1). Thus, the county's dairy industry made up half of all farming output and over 60 percent of farming employment. Accounting for ripple effects, the San Bernardino dairy industry accounted for nearly 2 thousand jobs, $31 million in labor income and $170 million in value added.

As we have seen with Los Angeles and Orange counties, most of San Bernardino's agricultural output comes from the processing industry. Agricultural processing contributed 84 percent ($3.9 billion) of total agricultural output in the county in 2010. The industry's 6,597 workers became nearly 14 thousand workers when multiplier effects were included. Total economy-wide labor income and value added from the industry were $710 million and $1.4 billion, respectively.

Finally, the agricultural-related share of total San Bernardino output was about 4.3 percent in 2010, similar to the share in Orange County (Table 6.5.1B). Yet, multipliers for San Bernardino agricultural production and processing were less than 2. At 2.24, the labor income multiplier for the dairy industry was significantly lower than in other counties and the aggregate region. Thus, labor income from this industry may have little impact outside of dairy, or may have more of an impact outside of San Bernardino than in it.

Table 6.5.1.A. Economic impact of San Bernardino County's agricultural production and processing, 2010

San Bernardino County: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	4,650	9,895	556	1,164	19,661	945	1,922
Agricultural processing[h]	3,899	6,597	405	854	13,978	710	1,391
Forestry, fishing, hunting	4	34	2	2	50	3	3
Ag support activities[i]	36	878	29	28	1,078	36	42
Farming	711	2,385	120	280	4,154	184	432
Grains & oilseeds	1	8	0	0	10	0	1
Cotton	0	0	0	0	0	0	0
Vegetables & melons	36	73	13	18	211	18	29
Fruit	49	130	20	26	316	27	40
Tree nuts	3	22	1	2	32	1	3
Greenhouse & nursery	97	240	53	64	655	68	94
Other crops	51	134	11	16	305	18	31
Beef cattle	47	204	2	8	281	4	15
Dairy cattle & milk	355	1,448	14	130	1,906	31	170
Poultry & eggs	63	39	5	11	135	9	18
Other animals	9	87	1	5	104	2	6
Total San Bernardino County economy	108,221	809,518	38,797	64,979			

Source and notes: see Table 4.2.1. A

Table 6.5.1.B. Economic impact of San Bernardino County's agricultural production and processing, 2010

San Bernardino County: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production and processing	1.99	1.70	1.65
Agricultural processing	2.12	1.75	1.63
Forestry, fishing, hunting	1.47	1.32	1.60
Ag-support activities	1.23	1.26	1.50
Farming	1.74	1.54	1.54
Grains and oilseeds	1.29	2.09	2.54
Cotton	0.00	0.00	0.00
Vegetables and melons	2.89	1.38	1.59
Fruit	2.43	1.35	1.54
Tree nuts	1.46	1.36	1.42
Greenhouse and nursery	2.73	1.29	1.47
Other crops	2.27	1.60	1.95
Beef cattle	1.38	2.19	1.92
Dairy cattle and milk	1.32	2.24	1.31
Poultry and eggs	3.47	1.76	1.62
Other animals	1.19	1.59	1.29

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

6.6 San Diego

The greenhouse and nursery industry in San Diego County is larger than in any other county in the state. Estimates of the 2010 total value of San Diego greenhouse and nursery range from $729 million to $1.1 billion (Tables 6.6.1A and 3.4.3). Using the IMPLAN model, we find that greenhouse and nursery sales constituted 17 percent of all San Diego agricultural output and nearly half of the county's farming output in 2010. There were about 3 thousand workers employed within the sector. Including all ripple effects, greenhouse and nursery farming created $597 million in labor income and $832 million in value added. Perhaps because greenhouse operations are so prominent, San Diego contains more farms than any other Southern California county and has the smallest average farm size (Table 3.3.1).

Other industries, particularly fruit farming and agricultural processing, were also important to the San Diego County economy in 2010. Fruit production generated $569 million in sales and created jobs for 7 thousand people throughout the economy. Total value added for this industry was $583 million. Agricultural processing made up 61 percent of total agricultural output in San Diego, though the direct and ripple effects of employment, labor income and value added were less than those of farming.

In San Diego County, the multipliers for agricultural production and processing were 1.97 for employment, 1.71 for labor income and 1.89 for value added (Table 6.6.1B). These are lower than the multipliers for the industry in all of Southern California. Like in other counties, grains and oilseeds had the highest value added multiplier. The greenhouse and nursery industry generated $0.72 in economy-wide value added for every $1 within the industry.

Table 6.6.1.A. Economic impact of San Diego County's agricultural production and processing, 2010

San Diego County: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	4,212	16,355	1,118	1,655	32,283	1,913	3,126
Agricultural processing[h]	2,566	5,800	349	696	13,914	767	1,442
Forestry, fishing, hunting	13	106	7	8	174	10	13
Ag support activities[i]	92	2,692	70	68	3,228	94	113
Farming	1,541	7,757	693	883	16,816	1,073	1,593
Grains & oilseeds	1	11	0	0	14	0	0
Cotton	0	0	0	0	0	0	0
Vegetables & melons	113	440	42	58	1,180	72	113
Fruit	569	2,930	235	303	7,125	398	583
Tree nuts	1	10	0	0	15	1	1
Greenhouse & nursery	729	3,460	403	483	7,787	597	832
Other crops	23	115	5	7	254	11	18
Beef cattle	6	49	0	1	65	1	3
Dairy cattle & milk	17	130	1	6	174	3	10
Poultry & eggs	53	63	5	10	186	11	21
Other animals	31	548	4	15	643	8	22
Total San Diego County economy	269,505	1,832,144	109,164	175,468			

Source and notes: see Table 4.2.1. A

Table 6.6.1.B. Economic impact of San Diego County's agricultural production and processing, 2010

San Diego County: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production and processing	1.97	1.71	1.89
Agricultural processing	2.40	2.20	2.07
Forestry, fishing, hunting	1.64	1.42	1.61
Ag-support activities	1.20	1.35	1.66
Farming	2.17	1.55	1.80
Grains and oilseeds	1.26	3.12	3.28
Cotton	0.00	0.00	0.00
Vegetables and melons	2.68	1.70	1.95
Fruit	2.43	1.69	1.92
Tree nuts	1.51	1.76	1.78
Greenhouse and nursery	2.25	1.48	1.72
Other crops	2.20	2.16	2.54
Beef cattle	1.32	3.23	2.50
Dairy cattle and milk	1.33	3.86	1.63
Poultry and eggs	2.96	2.28	2.11
Other animals	1.17	2.04	1.49

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

6.7 Santa Barbara

Agriculture is a significant contributor to the Santa Barbara County economy. Total agricultural production and processing accounted for 7.1 percent of industry output, 6.8 percent of jobs, 7.4 percent of labor income and 5.4 percent of value added in the economy in 2010 (Table 6.7.1A). Including indirect and induced effects along with direct effects, the agricultural shares in the economy become 10.9 percent for both employment and labor income, and 9.3 percent for value added. About half of agricultural production and processing output in Santa Barbara County came from farming. Accordingly, agricultural support services are also a significant share of the county's agricultural industries.

Santa Barbara County is home to over 700 thousand acres of coastal farmland (Table 3.3.1). A good deal of this land is well-suited to growing horticultural crops, particularly strawberries, which are the county's number one crop in value terms (Table 3.4.2). Of $1.2 billion in total farming output, fruit farming was $353 million, vegetable farming was $474 million and greenhouse and nursery production was $233 million (Table 6.7.1A). The employment effects of the vegetable and fruit industries were roughly equal, but labor income was lower for fruit farmers.

Generally, direct effects of agricultural industries are greater than their ripple effects in Santa Barbara County. This notion is reflected in the agricultural production and processing multipliers, which are less than 2 (Table 6.7.1B). The fruit farming labor income multiplier, for example, is 1.68, meaning that $1 in wages, salaries and proprietary income within the sector generates $0.68 in labor income outside of fruit farming.

Table 6.7.1.A. Economic impact of Santa Barbara County's agricultural production and processing, 2010
Santa Barbara County: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	2,349	16,718	939	1,095	26,717	1,388	1,899
Agricultural processing[h]	856	1,981	129	228	4,558	249	433
Forestry, fishing, hunting	22	225	12	13	354	17	21
Ag support activities[i]	307	7,571	243	239	9,170	309	363
Farming	1,164	6,941	555	615	13,714	827	1,117
Grains & oilseeds	5	128	1	1	161	2	3
Cotton	0	0	0	0	0	0	0
Vegetables & melons	474	2,296	204	242	5,870	339	477
Fruit	353	2,262	170	188	5,359	286	372
Tree nuts	9	138	4	5	212	7	10
Greenhouse & nursery	233	1,377	160	154	2,868	222	263
Other crops	43	275	11	13	591	23	34
Beef cattle	18	185	2	3	265	6	9
Dairy cattle & milk	10	99	1	4	134	2	7
Poultry & eggs	12	18	2	2	49	4	4
Other animals	7	162	1	4	192	2	6
Total Santa Barbara County economy	33,162	245,948	12,683	20,381			

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

Table 6.7.1.B. Economic impact of Santa Barbara County's agricultural production and processing, 2010

Santa Barbara County: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production and processing	1.60	1.48	1.73
Agricultural processing	2.30	1.93	1.90
Forestry, fishing, hunting	1.57	1.43	1.64
Ag-support activities	1.21	1.27	1.52
Farming	1.98	1.49	1.82
Grains and oilseeds	1.25	3.01	3.40
Cotton	0.00	0.00	0.00
Vegetables and melons	2.56	1.66	1.97
Fruit	2.37	1.68	1.98
Tree nuts	1.54	1.66	1.93
Greenhouse and nursery	2.08	1.39	1.71
Other crops	2.15	2.08	2.63
Beef cattle	1.43	2.84	2.94
Dairy cattle and milk	1.36	3.03	1.69
Poultry and eggs	2.71	1.84	2.02
Other animals	1.18	1.79	1.56

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

6.8 Ventura

Ventura County is the largest producer of fruit in Southern California. Fruit sales in the county were $750 million in 2010, or 49 percent of total farming sales (Table 6.8.1A). The Ventura farming industry is dominated by high-value fruit crops such as strawberries, lemons and raspberries, as well as vegetable crops like celery and tomatoes (Table 3.4.3). In fact, Ventura County produced 57 percent of total Southern California strawberry production value in 2010. The county's fruit industry employed about 5 thousand people, or 12 thousand when accounting for all ripple effects. Economy-wide labor income from fruit farming totaled $652 million and total value added was $837 million.

Besides the fruit industry, Ventura County also dominates the agricultural support industry in Southern California and is a significant contributor of vegetable products. Agricultural support activities in Ventura were worth $361 million in 2010, representing one-quarter of all such activities in the region. Agricultural support generated $443 million in value added and $373 million in labor income throughout the county economy. The vegetable industry contributed $411 million in sales to Ventura agriculture, or over one-quarter of farming output. Accounting for total effects, the vegetable industry generated less than half the labor income created by fruit farming. Accordingly, the labor income multiplier for the vegetable industry was slightly less than that of the fruit industry (Table 6.8.1B).

Multipliers for the Ventura County agricultural production and processing sector were very similar to Santa Barbara's. For every job created in the sector, 0.61 jobs were created in the broader economy. One dollar of labor income or value added generated within agricultural industries translated to $0.43 or $0.75, respectively, in other industries. Also, note that jobs in Ventura grain and oilseed or other animal production created almost no other jobs outside of those sectors, while the multiplier effects of grain and oilseed value added were 3.45.

Table 6.8.1.A. Economic impact of Ventura County's agricultural production and processing, 2010

Ventura County: Direct and total effects[a]

	Industry output (sales)[d]	Direct Effects			Total Effects[b,c]		
		Employment[e]	Labor income[f]	Value added[g]	Employment	Labor income	Value added
	($ million)	(jobs)	($ million)		(jobs)	($ million)	
Agricultural production & processing	2,670	19,933	1,248	1,329	32,074	1,783	2,332
Agricultural processing[h]	756	1,517	114	190	3,591	212	367
Forestry, fishing, hunting	12	75	5	7	136	8	11
Ag support activities[i]	361	8,048	293	288	9,998	373	443
Farming	1,540	10,293	836	844	19,701	1,220	1,577
Grains & oilseeds	0	7	0	0	9	0	0
Cotton	0	0	0	0	0	0	0
Vegetables & melons	411	2,234	188	209	5,411	314	434
Fruit	750	5,405	386	399	12,103	652	837
Tree nuts	1	23	1	1	34	1	1
Greenhouse & nursery	337	2,238	253	223	4,608	353	404
Other crops	3	23	1	1	47	2	3
Beef cattle	4	43	0	1	54	1	2
Dairy cattle & milk	0	1	0	0	1	0	0
Poultry & eggs	22	37	3	4	91	5	8
Other animals	11	283	3	6	325	5	9
Total Ventura County economy	64,876	413,374	22,507	38,580			

Source and notes: see Table 4.2.1

Table 6.8.1.B. Economic impact of Ventura County's agricultural production and processing, 2010

Ventura County: Industry multipliers[a]

	Employment	Labor income	Value added
Agricultural production and processing	1.61	1.43	1.75
Agricultural processing	2.37	1.86	1.93
Forestry, fishing, hunting	1.82	1.53	1.58
Ag-support activities	1.24	1.27	1.54
Farming	1.91	1.46	1.87
Grains and oilseeds	1.22	2.90	3.45
Cotton	0.00	0.00	0.00
Vegetables and melons	2.42	1.67	2.07
Fruit	2.24	1.69	2.10
Tree nuts	1.50	1.63	2.07
Greenhouse and nursery	2.06	1.40	1.81
Other crops	2.01	2.02	2.73
Beef cattle	1.26	2.10	2.57
Dairy cattle and milk	1.25	2.42	1.61
Poultry and eggs	2.48	1.75	2.06
Other animals	1.15	1.64	1.56

Source: see Table 4.2.1. A

[a]Each multiplier represents the ratio of total to direct effects of the named industry.

7. Concluding Remarks

Farming and the rest of agriculture plays an important and dynamic role in the economy of Southern California. Although the contribution differs among counties, overall, hundreds of billions of dollars in economic activity grows from agricultural roots in Southern California. This added economic activity translates into millions of dollars in tax revenue and hundreds of thousands of jobs in the region. Farming is just one part of this web of interconnected relationships. Agricultural input industries, processing and marketing of farm products and associated multiplier effects ripple throughout Southern California, even in locations where farming itself is not a major part of production or employment.

Agriculture also contributes to economic well-being in Southern California in ways that are more difficult to quantify. In relatively urban settings, agriculture often provides open space, environmental benefits and visual amenities that would not otherwise be available. And, whatever its landscape benefits, local agriculture provides a link to the food, fiber and foliage than so many urban residents tend to take for granted. This connection to our farming roots is perhaps more important in relatively urban regions than in more rural parts of California.

The broad picture of agriculture in Southern California is of a vibrant segment of the economy that has continued to supply the region with local food and other products while generating income and jobs for a sizable part of the population. Agriculture has adapted to an increasing Southern California population and its changing environment. We expect that Southern California agriculture will continue to contribute to regional economic vigor and broader social benefits.

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Appendix A: Data Sources for National, State and County Agriculture

The USDA's National Agricultural Statistics Service (NASS) is considered the authority on commodity-related statistics. NASS collects its national- and state-level data mainly from ongoing surveys and the U.S. Census of Agriculture, conducted every five years. Surveys are mailed to growers in the NASS database and then supplemented by telephone and field visits. [12] For many commodities, the Census also provides county-level data for acreage and number of farms, but not for production or prices.

In general, NASS verifies its county- and state-level findings using a combination of the Census and the annual County Agricultural Commissioners' crop reports. Each year, the NASS California Field Office, in cooperation with the California Department of Food and Agriculture, assembles data on agricultural commodities into its flagship publication, *California Agricultural Statistics*. County-level data is based solely on the Commissioners' reports.

County Agricultural Commissioners' reports are conducted independently in each California county and using a variety of sources. Sources may include grower surveys, shipment data, industry assessments, or regulatory and inspection data. For example, San Joaquin County acreage data is derived from a computer program used to issue pesticide permits and grower identification numbers to farmers, and from a pesticide use reporting program with the Department of Pesticide Regulation (DPR). Growers who fill out a DPR pesticide use report specify their treated crops and planted acreage, and this data is used for the Commissioner's report. [13]

Furthermore, each County Commissioner records commodity details differently. One county may report all strawberry production as one, while another may report data for processing and fresh market strawberries separately. Some counties refuse to allow individual disclosure of certain commodity figures due to confidentiality requirements, so these counties are lumped into the "Sum of Other Counties" category. Statistical verification of such widely varied data is limited, so estimates are approximate.

Because of the methodological issues within Agricultural Commissioner data, summing county data for commodities may not accurately represent a California state total. Commissioner estimates of California production value are significantly larger than the NASS estimates. For example, in 2010, NASS estimates that total cash receipts from California agriculture were $37.6 billion. For the same year, the County Commissioners

[12] Flohr, Doug. USDA, National Agricultural Statistics Service. Personal communication (March 7, 2012).
[13] Hudson, Scott. San Joaquin County Agricultural Commissioner. Personal communication (March 6, 2012).

reported that agricultural value of production (which, in California, should be very close to cash receipts on average) was $46.2 billion.

To provide illustrations of the potential differences between County Commissioner and NASS data for individual commodities, we can compare data for California strawberry, lettuce, and grape crops. For instance, the average strawberry price per ton for 2010 reported by NASS from the aggregated County Commissioners data was 12 percent lower than the state average price of strawberries from NASS data. In 2010, the sum of the Commissioners' estimates of total lettuce (head, leaf and romaine) production was 15 percent higher than the NASS estimate of total state lettuce production. On the county level, the San Joaquin County Agricultural Commissioner's report has reported total grape acreage as 35 to 40 percent higher than NASS estimates for San Joaquin for the past five years.

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Appendix B: The IMPLAN Model

The IMPLAN (Impact Analysis for PLANning) economic modeling system was developed by the U.S. Department of Agriculture Forest Service, together with the Federal Emergency Management Agency and the U.S. Department of the Interior's Bureau of Land Management. IMPLAN's secondary database is derived mostly from federal sources including the U.S. Department of Commerce's Bureau of Economic Analysis, U.S. Department of Labor's Bureau of Labor Statistics, U.S. Census Bureau, U.S. Geological Survey, and U.S. Department of Agriculture.

The model employs input-output tables to show transactions among sectors. For any given industry, the model enables quantification of outputs (value of production), jobs, labor income and value added both before and after taking into account the ripple effects on the entire economy. Activity that occurs within a particular industry, including sales, employment, labor income, and value added, is considered part of the direct effects of that industry on the economy. Indirect effects encompass activity generated in other industries as a result of their connection to the sector in question (i.e. industries that provide inputs or services to that sector). Finally, induced effects include changes in household consumption of goods and services caused by the effects of industry and inter-industry activity on population and income. We refer to the total, or ripple, effects of an industry as the sum of its direct, indirect and induced effects.

Because IMPLAN utilizes data from the USDA, our background agricultural statistics will in most cases line up with the direct effects component of IMPLAN's readout results. However, as there is some internal variation and constant updates within the USDA/NASS database, slight differences may appear. Similarly, we do not know the specific sources and access dates of the USDA data used to model each IMPLAN industry, so this may lead to further discrepancies. Indirect and induced effects will involve further interplay from data sources outside the USDA, such as the Bureaus of Economic Analysis and Labor Statistics, and so will not line up with our background statistics.

Source: Minnesota IMPLAN Group, Inc. (2010). IMPLAN Version 3.0's User Guide. Accessed May 2012: http://implan.com/V4/index.php?option=com_multicategories&view=categories&layout=blog&cid=222:referencemanualusersguidetoimplanversion30software&Itemid=14